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*The Poetry of Architecture.**

THE book issued under this title by Mr. Ruskin falls in one respect exceedingly short of the scope which so wide-reaching a title suggests. "The Poetry of Architecture" is indeed one of the most inspiring and one of the most unlimited subjects that a writer on art could select to deal with. It would include the consideration of the source and meaning of the impression produced on the mind by all the varied forms which Architecture in her greatest developments has put on; the colonnades of Greece, the domes of Rome and Byzantium, the fretwork and diapers and stalactite ceilings of the Saracen, the towers and spires of mediæval France and England, the palaces of Florence and Venice, and all the other forms of architectural design which have arisen from the earth; not to speak of the subdivisions of which the subject is capable,—the poetry of plan, the poetry of decorative detail, &c.; and considering that Mr. Ruskin's sub-title indicates "the architecture of the nations of Europe" at least as his subject,—a pretty large chapter out of architectural development, one feels brought up rather unexpectedly on finding that all these large words only refer to the architecture of cottages and villas, the former more especially; the kind of architecture which a painter is willing to introduce as part and parcel of a landscape, and under no belief that he is inserting any architectural element into the picture.

The fact appears to be that this is a republication of one of the author's earliest writings, a series of essays commenced in Loudon's *Architectural Magazine* in 1837, under the *nom de plume* of "Kata Phusin" (Κατά φύσιν—"according to nature"), with this very comprehensive title, and intended to be carried on through all the departments of architecture; but which, in their then projected form, did not get beyond the cottage and villa stage. The "Seven Lamps" and the "Stones of Venice" were in reality a part of the sequel which was never furnished under the original title. And in our judgment, with the exception of some brilliant and eloquent passages of prose-poetry which have almost become proverbial, the author in these more ambitious treatises went farther and fared worse. As long as he dealt with what may properly be called the poetry of architecture he had always something fine and impressive to say, though often in too rhetorical a manner; as soon as he came to expound the details of architectural style and construction he put fancies for facts, and lead his readers through pages of brilliant rhapsody which taught them nothing, or taught them wrong. In the earlier phase of his subject, which we have now presented to us again in this new dress, he had not arrived at the handling of architectural detail and structure in the full sense of those terms; he is dealing with a form of building which is hardly to be called architecture in its complete sense, and in which the interest lies not in carefully balanced mass or carefully designed detail, but in the general line and colour as considered in relation to the scene, and in a certain not easily definable sentiment, a certain national character, arising from the unconscious adoption by the builders of the construction and materials most suited to the conditions under which the dwelling had to be built. Now, of the sentiment of this kind of rural architecture there is no one who can judge better and write so picturesquely as Mr. Ruskin, and hence, notwithstanding the first dawnings of that tendency to rhetorical paradox which has been his besetting sin as a writer, we can find ourselves far more in sympathy with him in these early pages of his architectural criticism—a remarkable production indeed for a youth of eighteen—than in the more brilliant but often fantastic criticism of his later and more celebrated works.

Nothing could be better put than this, in the opening paragraph of the introduction:—

"If we consider how much less the beauty and majesty of a building depend upon its pleasing certain prejudices of the eye, than upon its rousing certain trains of meditation in the mind, it will show in a moment how many intricate questions of feeling are involved in the raising of an edifice; it will convince us of the truth of the proposition, which might at first have appeared startling, that *no man can be an architect who is not a metaphysician.*"

The italics are our own, and the sentence so emphasised is a brief expression of a truth which applies equally to music and ornament, the two other metaphysical arts, as distinguished from painting and sculpture, which are physical arts. In all those three arts the designer is dealing with ideals which are not expressed in visible nature, but which are only apprehended by thought; and consequently the right or wrong of a design in any of these metaphysical arts has to be judged not by the standard of natural form, but by a mental standard, arising out of a process of comparison of the means to the end. It is very probable that this opinion will be found to be directly contradicted in some later writings of the author; and it may be added that metaphysical reasoning has not so much to do with the criticism of the naïve forms of architecture considered in this book, as it has with more finished architectural design; but for all that the sentence here quoted embodies a positive and most important truth as to the intellectual position of architecture which is worth drawing special attention to, and which (again) is a remarkably thoughtful utterance for so young a man as Mr. Ruskin then was. It is for want of this reference to a metaphysical ideal that there is often so much uncertainty and difference in regard to architectural criticism, and that architects themselves (the younger generation especially) are so much governed by fashion and prejudice in their liking and disliking of architectural designs; now one type of architecture is the favourite, now another, and what does not conform to the immediately favoured type is scouted; whereas the whole right and wrong of the thing, æsthetically, is a matter of thought and reasoning, and what was good in architecture at one time is good at another, independently of fashion, excepting so far as the circumstances of life or climate may have altered.

In entering on his subject the author first considers the lowland cottages of England, France, and Italy, in order to show the manner in which these small and unsophisticated buildings express or harmonise with the character of the countries in which they

* The Poetry of Architecture; or the architecture of the nations of Europe considered in its associations with national scenery and national character. By John Ruskin. With illustrations by the author. George Allen; London and Orpington; 1893.

are respectively situated. The cottage gives animation and human interest to the rural scene without in any way disturbing its character. And he finds that as the retiring aspect of the English cottage, and its characteristic neatness, are in harmony with a scenery which is on a small scale; so in France, where the country is more bare, and the scenery on a larger scale, uninterrupted by hedgerows, the French cottage (when we can find one) is naked and bare in comparison; "the entrance is always open; no roses, or anything else, are wreathed about it; several out-houses, built in the same style, give the building extent; and the group . . . . stands comfortlessly between two individuals of the column of long-trunked fac-simile elms, which keeps guard along the length of the public road." The French cottage, he considers, though it cannot please by its propriety, gains interest by its substantial style and a certain evidence it gives of having once been fitted for the residence of prouder inhabitants, "of its having once possessed strength, which is now withered, and beauty, which is now faded. This sense of something lost, something which has been and is not, is precisely what is wanted. The imagination is set actively to work in an instant."

The succeeding chapter on the Italian cottage is full of beautiful writing, beginning with the special characterisation of the country (without considering which we cannot understand the buildings), "the sadness of Italy's sweet cemetery shore":—

"Every part of the landscape is in unison; the same glory of morning is thrown over the whole; the deep blue of the heavens is mingled with that of the everlasting hills, or melted away into the silence of the sapphire sea; the pale cities, temple and tower, lie gleaming along the champaign; but how calmly! No hum of men, no motion of multitude in the midst of them: they are voiceless as the city of ashes. The transparent air is gentle among the blossoms of the olive; and the small fountains, which, in any other land, would spring merrily along sparkling and surging among tinkling pebbles, here flow calmly and silently into some pale font of marble, all beautiful with life, worked by some unknown hand, long ago nerveless, and fall and pass on among wanflowers, and scented copse, through cool leaf-lighted caves or grey Egerian grottos, to join the Tiber or Eridanus, to swell the waves of Nemi, or the Larian Lake. The most minute objects (leaf, flower, and stone), while they add to the beauty, seem to share in the sadness, of the whole."

It is difficult to know whether to admire more the truth of the sentiment here, or the beauty of the language, a perfect bit of prose-poetry. One has only to reflect a moment to feel how completely at variance would be the English cottage here. An equally fine landscape passage follows, dwelling on the elevation of sentiment of the Italian landscape, in spite of its melancholy. And in such a land what do we expect of the cottage? Not neatness, but "a beauty, no matter how dilapidated, which may appear to have been once fitted for the surrounding splendour of scene and climate." The author might have made a reference here to Goëthe's charming little poem in which the Italian peasant invites the poet to his home, and he finds it nestled between the remains of two great temple columns. Concerning the Italian cottage itself, the author remarks on its suitability to its circumstances its low-pitched tiled roof, so that instead of appearing at a distance, like the English cottage, all red roof, it seems all white wall, with the dark shadows from the projecting roofs lying on them, the roofs which are projected for a purely practical reason, to keep the heat off the walls and the windows; and "these long oblique shadows on the white surface are always delightful, and are alone sufficient to give the building character." Various other points of special character, all arising out of local influences, are followed out in the succeeding pages, the whole of which are both true in themselves and expressed in the most felicitous manner. The Swiss mountain cottage is analysed in the same manner, and then we return home once more to the Westmoreland mountain cottage, with its door "flanked and roofed by three large oblong sheets of grey rock whose form seems not to be considered of the slightest consequence;" a touch which almost in itself brings the character of the dwelling before us. We object to one assertion in this chapter, made *en passant* as an illustration, to the effect that "anything which to the eye is split into parts, appears less as a whole than when undivided." Not less in apparent dimensions, certainly; all architectural experience and observation is to the contrary: it may have less expression of weight and mass.

A succeeding "Chapter on Chimneys" is piquant and interesting. The dignity of smoke, says the author, is now better understood than in barbarous ages; "it is dismissed through Gothic pinnacles, and (as at Burleigh House) through Tuscan columns, with a most praiseworthy regard to its comfort and convenience. Let us consider if it is worth the trouble." The first position laid down is that smoke is worth something in a cottage, where it is seen against trees or other background, when it assumes a silvery grey tone, and gives the charm of silent movement,* but in more ambitious buildings it is only seen dark and sooty against the sky, and is an eyesore. Consequently, decorated chimneys are never to be approved, as they are out of place in the cottage, and in the mansion it is no use drawing attention to that which is a drawback. Perhaps it would not be difficult for an ingenious person (even for Mr. Ruskin himself) to reason the other way about; but after all, as the Fool in "Lear" says, "it is a pretty reason." But to come to the design of chimneys, where there is no attempt to make them too decorative—we are given a series of small sketches of chimneys of different nationalities, and a critical comparison of their merits. The architect will find some suggestive remarks in this; we can only here observe that we quite agree with the author in preferring the three English examples of cottage chimneys to any of the others, as being more simple, more directly obvious in their object, and consequently more truly picturesque than any of the foreign examples. Generally speaking, the author's conclusion is that the form of chimney which attracts least attention is the best. This would be a sad blow to some of the builders of modern Elizabethan houses; but we observe that with a good many of our best architects at present there is a growing feeling in favour of the simple treatment of chimneys.

The chapter on the relation of cottage building with varying characters of landscape in the same country, contains remarks worth attention, though we differ utterly from the dictum that while white in shade (in a cottage in a woodland country) is allowable, "if visible at any point more than 200 yards off it will spoil the whole landscape." How many instances to the contrary could be brought, both in pictures and in actual scenes.

We proceed to the consideration of villa architecture; and in regard to the Italian villa will only pause to note one acute remark, to the effect that this is a heritage from the time when Rome kept the whole Italian peninsula in order:—

"Such a building could not exist in Greece, where every district a mile and a quarter square was quarrelling with all its neighbours. It could exist, and did exist, in Italy, where the Roman power secured tranquillity, and the Roman constitution distributed its authority among a great number of individuals, on whom, while it raised them to a position of great influence, and, in its later times, of wealth, it did not bestow the power of raising palaces or private fortresses. The villa was their peculiar habitation, their only resource, and a most agreeable one; because the multitudes of the kingdom being, for a long period, confined to a narrow territory, though ruling the world, rendered the population of the city so crowded, as to drive out its higher ranks to the neighbouring hamlets of Tibur and Tusculum."

He goes on to remark that in very perfect Monarchies, "such as Austria," the power is in the hands of a few who build themselves palaces rather than villas, while in perfect Republics "the power is so split among the multitude that no one can build himself anything." The United States must on that score be a very imperfect Republic, but it must be remembered that this was written over half a century ago. When we come to the English villa, we find a discourse in the first instance on "Principles of Composition," which certainly is calculated to excite curiosity. The first principle insisted on is that a man who builds a country house should, in regard to the outside of the house, think of his neighbours' taste more than his own, since the outside of the house concerns them much more than it concerns the man inside. There is a good deal of truth in this, though it is carried a little too far for serious earnest. The chapter contains other remarks which are suggestive in a sense, and it is all sufficiently original to be worth reading on that account alone, but the "principles" are not very obvious, and of the three windows given to illustrate three different treatments, we can only say that they are all equally ugly; these are reprints from the cuts which accompanied the original papers, and it is a pity they were revived.

There are some admirable remarks on brick houses, which are praised for many qualities; air of respectability, incapability of looking absurd, adaptation to the climate; but all this is only in one class of plain cultivated country, where these qualities of brick "atone for its ugliness" (odd to read in the present day); once in a more picturesque country and "we take leave of brick for ever." We quite agree however with the objurgations against "stone dressings." In undulating country, or what the author calls the "picturesque blue country" (cultivated country) as distinguished from the "simple blue" country (where we may have brick), the buildings should be square and massive, which we think is true; and the author remarks that about this class of English country there is a good deal of the character of Greek landscape, and hence Greek lines of building may be expected to go well with it; "nothing can excuse one acute angle, or one decorated pinnacle," which is a bit of the author's habitual exaggeration; but the view maintained is true in the main. In woody, or what he calls the "green country," Elizabethan or something analogous is to be preferred; but we may observe that this depends very much on the nature of the trees, which influence the lines of the landscape a good deal. A remark as to the building may be quoted:—

"The building must be either quite chaste, or excessively rich in decoration. Every inch of ornament short of a certain quantity will render the whole effect poor and ridiculous; while the pure perpendicular lines of this architecture will always look well if left entirely alone. The architect, therefore, when limited as to expense, should content himself with making his oriels project boldly, channelling their mullions richly, and, in general, rendering his vertical lines delicate and beautiful in their workmanship; but if his estimate be unlimited he should lay on his ornament richly, taking care never to confuse the eye."

We do not like the expression "lay on," but in its general sense the advice is sound, and reminds one of Sir Charles Barry's opinion that a building could not be too richly decorated as long as every part was carried out on the same relative scale of richness. The one or two diagrams made out for illustrating the composition of the lines of the villa in regard to those of the landscape, and many of the rather rambling reflections on this subject, are of little practical value, and rather savour of riding a hobby to death; but some of the suggestions will bear consideration, and the main principle, that where the lines of the landscape are vertical the building should be horizontal, and the converse, is clearly kept in view.

The illustrations are an important part of the attractiveness of the book; these are nearly all reproductions, very well executed, from new or at least unpublished sketches of the author, and though their relation to the text is not always very obvious, they are

* "Azure pillars of the hearth
Arise to thee."—Tennyson.

charming in themselves; indeed we have always considered that if Mr. Ruskin had chosen to write less and paint more, he would probably have been one of the foremost artists of the day, as he is certainly the foremost architectural sketcher. The literary portion of the book however, was well worth preserving and re-issuing, and we are only too glad to be able to find ourselves so much more in sympathy with the author in this than in some of his later and more ambitious works on architecture, in which he has handled in dictatorial style, and with an ever-increasing passion for rhetorical paradox and exaggeration, subjects which he only half understood and on which his opinions seem never even to have been settled. The present charming volume is a welcome exception in this respect. We may add that the publisher has done everything for it in the shape of fine paper, type, and margins of noble extent.

ANTHRACITE COAL.

THE subject of fire and fuel is being discussed in our correspondence columns, and the question again raised as to the possibility of meeting the smoke difficulty by the general use of anthracite. As we have already suggested in a comment on a letter printed last week, the question (or one main question) is whether, supposing that the general use of anthracite would be an entirely satisfactory solution in itself, there is likely to be enough anthracite available to keep up the supply for any practically unlimited period, and whether it could in that case ultimately be supplied at the present price of bituminous coal.

It is impossible to give even an approximate estimate of the amount of workable coal at present lying in the strata forming the earth's crust,—our knowledge of the geology of many countries is too meagre; therefore, the resources of coal in the world are unknown. It is true that we can form a fair idea of the geographical positions of the various coal-basins (except in regard to unexplored regions), but, as a rule, the actual extent of these basins, and the number and quality of the coal-seams contained therein, are problems as yet unsolved. Even in civilised countries, where geological surveys have been carried out as accurately as may be, the resources of many coal-fields are only arrived at by mere guesswork. Under the circumstances, it would be futile to attempt to estimate the amount of either anthracite or bituminous coal available as supplies to be drawn upon. Judging, however, from the known occurrences of both these fuels, and from our knowledge of their respective modes of origin from a geological point of view, it is practically certain that there is but a very small proportion of anthracite as compared with the bituminous and other coals in the world. If we take the British Isles as an example we find that the only districts where anthracite occurs in any abundance is in the South Wales coal-field, Kilkenny in Ireland, and Linlithgowshire in Scotland. Only in the first-mentioned district is it present in large quantities, and it is there confined to the western part of the coal-field. Thus the remaining coal-basins of the country from which we at present draw our chief supplies are not available for the supply of anthracite. Anthracite occurs in Belgium (notably at Mons), France, Spain, Saxony, Russia, and other parts of Europe, and it occurs sparingly also in the gigantic coal-fields of Australia and elsewhere, but the greatest development of the mineral is in the United States. Large as is the area occupied by anthracite there, however, it sinks into insignificance when compared with the areas occupied by the bituminous coals. These latter are found in the United States over an area of more than 220,000 square miles* (excluding the extensive coal-basins in the Rocky Mountain region and along the Pacific coast); whilst the anthracite coals occur only in Pennsylvania, New England, Colorado, and New Mexico,* and occupy an area of 985 square miles only,—and these are the largest beds of anthracite in the world. The total output of coal in the United States in 1890 was 157,788,656 short tons, and of this about 47,000,000 short tons was anthracite, showing that the latter mineral is much in demand.

The use of *pure* anthracite in domestic fires would, no doubt, greatly tend to abate the smoke nuisance. In a strong draught it burns without fusing, smoking, or smelling, and gives out a great heat. It kindles with much difficulty, but this may be largely overcome by breaking it up into small pieces,—as is done in the United States. In regard to its non-smoke-producing qualities, this important factor may be considerably modified by the composition of the anthracite. This mineral passes by insensible gradations into the bituminous varieties of coal, an intermediate stage being furnished by the semi-bituminous steam coal of South Wales. If a very large demand for anthracite were to be created, we should doubtless find plenty of the inferior or semi-anthracite kinds (which are by no means smokeless) selling in the market as the real commodity.

Coming to the main question, it seems very doubtful whether, from the practical point of view, the public would submit to be compelled to burn only anthracite as fuel. The demand would be such that its price in England must become almost prohibitive. We should certainly have to import large quantities from the United States, to the detriment of our own coal industry. If anthracite occurred more abundantly in this country, we should be only too glad to acquiesce in the views of our correspondent; as it is, we are afraid his suggestion will not generally be entertained.

* See "Mineral Resources of the U.S, 1889-90," pp. 146-7 (just issued).

* There are a few minor patches scattered here and there in the States.

NOTES.

THE first meeting of the London Reform Union is announced to take place at Exeter Hall on the 15th, under the presidency of Lord Rosebery. From some of the "leaflets" of the Union which have been sent to us, it appears that part of its proposed work is to assist working men and others who occupy houses at low rents in compelling landlords to keep the houses in sanitary condition. This will be a good work, no doubt, but it is to be hoped that the Reform Union will recognise that others besides working men require alterations in the present law as between landlords and tenants. The leaflet entitled "Is your house healthy?" draws attention to the fact that when a man takes a house at over 20*l.* a year he takes it at his own risk, while if the rent is under that amount the landlord is obliged by law to warrant the place as reasonably fit for human habitation; but the Reform Union does not think it worth while to make any comment on this monstrous anomaly. In short, as far as the information sent to us goes, the Union seems to be established mainly in the interests of the working man, and from the names on the bill announcing the meeting it would appear that it is to a considerable extent a political movement. The politics may be our own, but we are not the less of opinion that reform in matters connected with the sanitary condition of life in London has nothing whatever to do with political partisanship, and if the London Reform Union is to be conducted on political lines it will neither be a success nor command general confidence.

WE much regret to notice that the London County Council has shown itself so weak and irresolute in regard to a memorial from the Vestry of Kensington which came before their last meeting, urging the Council to apply for powers to control and regulate itinerant musicians, street noises, and other similar annoyances in London. In spite of strong support from several members, the proposal was shelved, apparently because the County Council has not yet got that control of the police which it is hungering after, and pretends that it cannot therefore enforce by-laws on the subject. This is a mere subterfuge, as it is perfectly certain that if such by-laws were made the police authorities would support them, and the decision arrived at on Tuesday is very discreditable to the common sense of the majority of the County Council. The nuisance of street noises in London is a crying evil, which ought to be taken in hand and dealt with strongly, and the County Council has held its hands and refused to deal with it on a mere *doctrinaire* theory of police control.

FROM the last quarterly report of excavations at Athens (*Mittheilungen*, November, 1892), we learn that the works began last autumn and continued during the spring round about the Areopagos and Pnyx have been set in hand again this month. A further portion of the old Panathenaic road has been laid bare in the south-easterly direction, *i.e.*, higher up towards the Acropolis. It is found that on both sides it is bounded by the foundations of ancient buildings, of which, in some cases, the boundary stones have been discovered, so that it is not too much to hope that very shortly we may hear of the discovery of some definite building known to classical literature,—if one absolutely fixed grant can be got we shall probably hear no more of the "Enneakrunos episode." The excavation is being carried on by the German School. The Greek Archæological Society is at work in the sacred city of Eleusis, and is just now digging near the Monastery of Daphni. Unfortunately, the hope cherished by the excavators that they had found the *hieron* of Apollo, mentioned by Pausanias (L. 37, 6), has proved to be ill-founded. Corinth so far has been an almost wholly neglected field, but the Archæological Society is at work there also, under the skilled direction of Mr. Skias. The object proposed is to free the site of the ancient Agora. So far this has not been done, but the excavations already show that the Byzantine structures and the classical work beneath them are in far better preservation than was at first feared. The remains discovered were so effectually covered by accumulations of earth that not a trace was visible when the excavations began. There seems every prospect that the topography of the town will be completely made out.

WE hear that Mr. Percy E. Newberry, with a staff consisting of Mr. Percy Buckman (artist), Mr. John E. Newberry, A.R.I.B.A. (architect), and Mr. Howard Carter (draughtsman) is leaving England this week for Upper Egypt to carry on the archæological survey under the auspices of the Egypt Exploration Fund. The great capital of Tel-el-Amarna will be the main seat of operations for the coming season. The private work of Prof. Flinders Petrie during last winter has elucidated many points relating to the city itself, but the numerous rock-cut tombs of courtiers of the heretic king, with their abundant scenes and inscriptions, still await a thorough survey, and promise to throw much light on the official creed and mode of life in a remarkable epoch of Egyptian history.

WE hear that at a meeting of the Society of Antiquaries on December 1 the following resolution was proposed by Sir John Evans, seconded by Sir Charles Robinson, and carried unanimously:—

"The Society of Antiquaries hear with great regret that considerable portions of the cathedral church of Lichfield, the work of Bishop Hacket after the sieges of the Great Rebellion, though substantial and well-looking, have been replaced by modern imitations of supposed thirteenth-century

work, thereby destroying the traces of one of the most remarkable epochs in the history of the Church of England.

The Society is also informed that further destruction of good seventeenth-century work is in contemplation, and ventures to earnestly urge the Dean and Chapter of Lichfield not to permit any such destruction to take place."

Whether the particular work which it is intended to remove is such as ought to be preserved on architectural and archæological grounds, is a matter on which we must decline to express an opinion without fuller information and a visit to the cathedral; but if it is so, we fear the appeal of the Society of Antiquaries will fall on deaf ears. It was a well-known Canon of Lichfield, it may be remembered, who amused himself by writing a Latin poem in praise of Lord Grimthorpe's architecture, which caused the latter so much joy that he could not forbear flourishing the fact in print, although, as we pointed out, it was only an offering of family devotion. But the architectural atmosphere of Lichfield is Grimthorpian, and we know what that means.

A SERIES of ten decorative pictures occupying the long panels (which virtually take the place of a triforium) between the nave arcade and the clearstory of St. Peter's Church, Plymouth, are to be executed by Mr. E. A. Fellows Prynne, and deal with events in the life of St. Peter. One of these is about to be fixed, and will occupy one of the bays on the north side of the church. The picture has been painted in oils on canvas in the usual manner, and will be fixed to the masonry. As it will be some considerable height from the ground (about 30 ft.) when fixed, the figures—and, in fact, the whole design—has been treated with a good deal of breadth, and the colouring, which at present looks somewhat vivid, will no doubt also be considerably toned by the more subdued light of the church. At either end of the picture is a smaller panel containing a shield charged with the keys of St. Peter, and a scroll with the title of the central subject—in this case, "St. Peter Confessing the Lord is Christ." The whole is about 16 ft. in length.

LAST summer, Professor von Helmholtz, with certain of his assistants, visited England for the purpose of making exact comparisons between the electrical units in use in England and Germany, and of attending the Edinburgh meeting of the British Association. At this meeting the whole subject was fully discussed in the presence of several members of the Electrical Standards Committee, Dr. Guillaume, of the Bureau International des Poids et Mesures, and Professor Carhart, of the University of Michigan, U.S.A., being also present, as scientific representatives of their respective countries. The result of the discussion has been a slight modification of the resolutions of the Electrical Standards Committee, published in Monday's *Times*, as a supplementary report to the President of the Board of Trade. The chief changes are that the standard of resistance is defined as that of a uniform column of mercury of given length and mass, instead of, as formerly, of given length and cross section; that the solid metal standard is to be from time to time verified by comparison with a column of mercury of known dimensions; and that the British Association unit, though still defined, as before, in terms of the new unit, is no longer to be used as a standard of comparison. The temperature at which the Clark cell is to be used as a standard of pressure is now expressed in degrees Centigrade, and the limit of error has been more exactly defined. Mr. Mundella will not, however, find his bewilderment as to the meaning of the alternating ampere in any way diminished, its definition standing in the new resolution exactly as in the old. It is to be hoped that the labours of the Committee will result in that international agreement respecting the standards employed, which is of far greater practical importance than even theoretical accuracy in the determination of the above standards. The scholastic instinct of the *Times* reader is, doubtless, responsible for the reappearance of the grave accent in such words as "ampere" and "centimetre," though it was deliberately rejected by the Committee on the ground that these are now English words.

THE discussion at the London School Board last week on the subject of "insanitary and dirty schools," though there was a good deal of difference of opinion expressed, constituted practically an admission that some of the Board Schools were in a discreditably dirty condition, and the Rev. S. Headlam was quite in the right in his remark that the more dirty were the children attending the schools the more necessary it was that the schools should show an example of cleanliness. The defence set up for the schools was that they were painted and cleaned once in eight years, according to what appears to be the requirement of the Board. Then we should certainly say that is not often enough, and that the requirement should be reconsidered and altered. At a later point in the proceedings, the Rev. E. Coxhead brought up what may be considered one of the latest illusions of the day, that a public body like the School Board could effect a saving of expense by building their own schools and dispensing with the intervention of the contractor. This is one of the foolish cries of the day, for which the London County Council has set the example. Mr. Coxhead, as he was very plainly told, showed utter ignorance of the practical conditions of building, and seemed to be quite unaware that a large initial expenditure in building plant must be a necessary condition for any such undertaking. The feeling of the more reasonable of those who spoke in partial support of the proposal was that, inasmuch as another public body had decided to try the same course, they would be wise at least to wait and see what was the result of that experiment. Eventually the motion was negatived by 35 to 9.

IT is not unprecedented that, when a fire arises on premises fitted with the electric light, its origin should be attributed, on little or no evidence, to electricity. The remarkable point about the fire of last month in Regent-street is that electrical engineers are amongst those most anxious to show that it arose from over-heated wires. The explanation of this circumstance is to be found in an interesting correspondence in the last two numbers of the *Electrician*. For some time past many electrical engineers have been in favour of earthing one of the conductors in certain systems of distribution; it is done in the Ferranti high-tension system, and in New York the Edison Company have for some time past earthed their middle wire; but the opposition of insurance companies, the caution of the Board of Trade, and the want of agreement amongst experts, has made the general adoption of this plan almost hopeless. The Regent-street fire, however, and the comments on it by Mr. Human, have put the question in a new light, and it is at least open to argument that increased safety would be obtained by earthing one main. Mr. Human shows clearly that it is possible that through leakage a fire may arise, even when the current is turned off, unless, indeed, double-pole switches are everywhere used, which is, in many cases, impracticable. A multiplication of safety-fuses would, indeed, guard against this danger, but not against the serious loss from unsuspected leaks which are yet not of sufficient magnitude to blow the fuses. No doubt the ideal system is to insulate both conductors, and maintain their insulation at a high figure, but experience has shown that this is not attainable, at any rate for long. The companies may secure it in their mains, but the houses are not equally under their control; a leak may arise after the house installation has been tested and passed, and may be for a while of no consequence; a leak on the other main in another house may suddenly make it dangerous, or at least lead to a letter to the *Times* on the untrustworthy character of electrical meters. With one main earthed, faults may still occur; but they are almost certainly detected as soon as they arise, and are, therefore, much more easily remedied, though, no doubt, more serious at the time. The prejudice against this plan probably arises in part from confusing it with an earth return, and also from a fear that dangerous shocks would be more common if one conductor were always connected to earth. The latter danger is entirely obviated by the use of concentric conductors with the "live" wire inside; while as to the former objection the difference between bringing the current back by a conductor nearly at the potential of the earth, and turning it loose to find its way back by gas or water pipes, or how it can, is, surely, not a difference that needs to be insisted on. There remain, however, two difficulties which will require most serious attention from the advocates of earthing conductors, viz., the danger to the cable itself, and to any metallic material near it, of injury by electrolytic action; and, unless the cable is earthed at one point only, the impossibility of confining the return current entirely to the conductor.

IN many towns in the United States mechanical means of operating street railways have all but entirely superseded horse traction, and that with great advantage to the inhabitants in many respects. Where electric or cable cars are running, the passengers can be carried with quickness and certainty to almost any part of the town. The cars travel at a far higher speed than would be tolerated in this country, but accidents are by no means frequent. People get accustomed to the rapid approach of the vehicles, and take care to get out of the way. There is this advantage with a street railway, that one knows exactly where it is coming. It keeps a definite track, and does not wander all over the road, like the unwieldy omnibus, nor does it dash across unexpected crossings after the manner of the more active hansom. It does not at present seem likely that we shall ever see mechanically propelled cars travelling at speed in our own crowded streets, but it must be remembered that the street railway would be not an addition to the present omnibuses and cabs of London, but a substitution for them. In America, the cars run so quickly, —with no stoppages at street-corners and loiterings from point to point, after the manner of the London omnibus,—that cabs are superfluous for ordinary purposes, and this is rendered more absolutely the case by the perfect system of "expressing" baggage in vogue in America. If our highways were cleared of omnibuses and nine-tenths of the cabs,—especially "crawlers,"—it is wonderful what clear streets we should have. One remembers the almost deserted aspect of our thoroughfares during the recent strike of the omnibus men. Broadway, the chief artery of traffic in New York, is to be operated by a cable line, and it is considered by many in the United States that horse cars will soon be a thing of the past, excepting in certain special cases. The point that remains to be decided by Americans is whether cable traction or electricity will survive as the fittest. The former was long supposed to have the advantage of cheapness, but recent investigations appear to negative this. At a recent convention of the American Street-railway Association, held in Cleveland, Ohio, a report was read in which this subject was dealt with on the basis of actual experience, when it was shown that while an electric road will pay a little over 7 per cent. per annum, a cable-road, under the same circumstances, would pay something over 5 per cent. per annum. In connexion with this matter

it may be stated that 89 per cent. of the electric roads of America are paying dividends of from 5 per cent. to 12 per cent.

IN a communication made by Dr. W. Jordan, quoted in the current volume of the "Transactions" of the Institution of Civil Engineers, the construction of stands for levelling instruments is discussed. In levelling, the instrument has to be set up more frequently than in surveying, and, therefore, any small saving of time is important. For levelling along high roads and towns, Dr. Jordan found it saved time if he inserted a not over-sensitive spirit-level in the top of the tripod. By moving the legs, it is easy to bring the bubble to the centre, and this can be trusted to the assistant. For levelling the instrument itself, merely a few turns of the screws will be required, since by the preliminary adjustment of the tripod legs everything has already been brought nearly to a horizontal position. This method is unsuitable, unless firm ground can be found for each leg. In the latter case Dr. Jordan finds useful a tripod with adjustable slotted legs, fitted with a circular level. Other methods have been devised to the same end. Gallemand has introduced a ball-joint in the tripod head. Another way is to place the level on a plate supported above the tripod head by three coarse adjusting screws. It is better to use two tripods, each in turn being taken on ahead to be adjusted by an assistant. In this way Dr. Jordan was able to level a railway at the rate of one mile an hour with a mean error of 0·13 in. per mile.

THE Ruabon Brick and Terra-cotta Company have gained a second victory over the Great Western Railway in an appeal case heard before Lords Justices Bowen, Lindley, and A. L. Smith on the 6th. The case is that the plaintiffs conveyed to the defendants the surface of a portion of their land, under which was some valuable clay still unworked, and which the plaintiffs retained the right to work for their manufacture. Subsequently the plaintiffs commenced to mine this clay, and in so doing went on the surface of the ground which they had conveyed to the railway company, which the latter endeavoured to put a stop to. The court, however, upheld the previous judgment, that as the railway company had declined to buy the land outright, and the Ruabon Company had retained the right to work the clay, they had the right to use all the usual means necessary to work it, and the appeal was dismissed with costs. It would certainly appear that the conveyance of the surface of the land to the railway company was in that case of rather an illusory nature.

ACCORDING to an American technical paper—*Engineering News*—the hub and shaft of the "cable-wheel" for the new power-house of the Broadway Cable weighs about 40 tons. The fact is interesting in itself, but more so from the light thrown, by its passage through the streets, on the state of New York pavements. The forging was taken on a wagon dragged by twenty-six horses. The load was about 10 tons per wheel, and in some places the paving was depressed nearly one foot. "This," our American contemporary says, "does not speak well for our pavements." Not only does it not speak well for pavements, but it does not speak well for the road-making from top to bottom. The same remark applies to the municipal authorities. Further west, however, the citizens are better served. In St. Louis, some time ago, a reel of wire cable was taken in a wagon over the new "Telford Pavement," the load being nearly 14 tons per wheel, and caused no depression of the surface. It would, of course, add to the value of the information if we knew the dimensions of the wheel tyres.

THE correspondence in the *Times* on advertisements has drawn some amusing letters from some of the most valorous advertisers of the day, who seem (or pretend to seem) quite unable to understand why any one should object to their monstrosities, and who have endeavoured to draw a red herring across the scent by pointing out that periodical literature cannot be carried on at its present cheap rate without advertisements. No one has denied or pretended to deny that; what is complained of is the intrusion everywhere of vulgar and flaring pictorial advertisements, of which the apologists for the system are the persons most guilty. Mr. Waterhouse, in a second letter in the *Times* of December 2, points out, in regard to the tumult of advertisements at railway stations and along railway lines, that the companies should remember that "they did not get their powers to act as advertisement agents, and disfigure the countries they pass through."

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE third ordinary general meeting of this Institute for the present Session was held on Monday evening last at Conduit-street, Mr. J. Macvicar Anderson, President, in the chair.

The New Honorary Secretary.

The President said that as they all knew, they had lost the services of a valuable official as honorary secretary in Mr. Aston Webb; but they had the pleasure of having with them that evening their new honorary secretary, Mr. William Emerson, and he thought that the members would like to accord him a hearty welcome as he was entering on his duties. (The President's remarks were received with applause.)

Mr. Emerson said he was very sensible of the honour which the members had done him in electing him to take the post of honorary secretary. While he could hardly expect to fulfil the duties of the office as well as his forerunners the President and Mr. Aston Webb, he could only say that he would use his best endeavours to deserve the confidence that had been reposed in him.

The Examinations.

The President next made a statement with regard to the Examinations recently held by the Institute. He said he had much pleasure in reporting the result of the Preliminary Examination held in London, Manchester, and Bristol on November 15 and 16. As had already been mentioned in the Institute's *Journal*, 97 applications were made for entrance to the Examination, of which 92 were new applications, the remaining 5 being candidates relegated to their studies at previous examinations. Of the 97 applicants, 40 were exempted in accordance with the regulations, 35 passed, 5 were relegated to their studies (4 in all subjects and 1 in certain subjects), 2 did not pass, and 15 either withdrew their applications or did not present themselves. Thus with the 40 exempted candidates 75 had passed and had been registered as Probationers. The President then read the names of the successful candidates, whose ages, he mentioned, ranged from 16 to 26 years. In reference to this examination, the President said he was glad to be able to inform the Institute that for the first time since the establishment of the Preliminary Examination, six out of its eight subjects had been trusted to a professional examiner, who had set the questions and marked the answers. The assistance thus obtained had proved so valuable that it would be sought in future Preliminary Examinations. The result of the *Intermediate* Examination held in London on the 15th, 16th, and 17th of last month had been announced by him at the last meeting. Of 30 Probationers who applied for entrance to the examination, 24 were accepted, and 13 passed and were admitted. The Examination in Architecture, to qualify for candidature as Associate of the Institute, was held last week in London, 50 applications were received, of which 10 were from candidates relegated from previous examinations; 9 were not accepted, and 5 others either withdrew their applications or did not attend. Of the 36 who were examined, 8 had been relegated to their studies in all subjects, and 16 others to their studies in certain subjects; therefore only 12 passed the Examination,—exactly one-third of the number of candidates examined. The names of the successful candidates were:—

Allen, T. A. (London).
Brakspear, H. (Corsham).
Cresswell, J. J. (Grimsby).
Cumming, W. N. (Edinburgh).
Hill, A. R. (Bradford).
Johnson, W. E. (London).
Jones, J. H. (London).
Keith, J. M. (London).
Ryan-Tenison, A. H. (London).
Sargant, L. E. A. (London).
Ward, W. H. (London).
Waterhouse, P. L. (London).

He regretted to note that the Board of Examiners had been compelled to relegate to further studies an unusually large number of candidates, on account of the unsatisfactory quality of the work done during the written, oral, and graphic examination. As the standard of excellence had not been raised, the Board could only attribute the result to the want of proper study on the part of those who had been unsuccessful, who seemed to have given preference to the more popular manuals, to the neglect of more important works. The best thanks of the Board of Examiners and of the Institute were due to the Bristol and Manchester Societies for the assistance rendered by them in connexion with the Examination.

The Ashpitel Prizeman.

The President announced that from among the sixty-one gentlemen who had passed the Examination in Architecture during the past year, Mr. A. C. Houston, of London (a pupil of Mr. James Edmeston), had been awarded the Ashpitel Prize, which consists of books to the value of 10*l.* 10*s.* Mr. Harold Brakspear, of Manchester, having been specially commended by the Board of Examiners, had been awarded a prize of books of the value of 5*l.* 5*s.*

Mr. William C. Street then read a paper on

Some Problems of Town and City Development

After a few introductory remarks, the author said the subject of open spaces might be considered more a sanitary or a surveyor's question than one for architects; but that was hardly so, as the extension of building generally created the necessity for open spaces, and therefore new buildings should be designed with regard for open spaces. Modern practice, until the last few years, had been too much the opposite. In the extension of any large city, architects and public authorities should show more consideration for the surroundings and requirements of the population, and should work in accordance with an approved plan for the future development of such city. A great enemy to any such beneficial development had been the land-grabber, who, having purchased land in the outskirts, planned as many streets as possible for the sake of the ground-rents. It might be said that this did not affect architects, but he considered it was within the power of architects to advise or influence public bodies, and to so direct public taste, that enactments might be passed providing for the development of cities in accordance with a recognised and wholesome scheme. Good main thoroughfares, with ornamental and recreative open spaces at convenient distances between them,—the minor streets being sufficiently wide,—were to be desired. Many might exclaim that the attempt would improve picturesqueness out of the streets, and produce monotony, but it was not inevitable; the main avenues should be lined with buildings worthy of architects, the adjacent streets be healthily and brightly finished, and intermediate and diversified recreation-grounds be provided. In certain cities regulations existed to prevent the building of dwellings outside certain limits until the intervening spaces were filled up in accordance with an agreed-upon scheme. Such stringent regulations might at first frighten those who looked upon so-called natural developments alone as being beautiful, but that was an open question. A square or rectangular development, as of American cities, the author thought, was unnatural, the tendency in all cities being for the traffic to pass and repass upon lines radiating from the centre where the principal business was conducted. The impression given by such radial development was far from unpleasant. It had been suggested that districts should be allotted for labouring classes. Mr. Street considered the separation of the classes neither healthy nor natural. In laying out a district it was better for the health of the dwellers in the main avenues that in the

minor streets adjacent the buildings should be less in height than those in such avenues, the air at the back of the higher buildings being open to the circulation of currents at a lower level, and not so stagnant and unhealthy as when the space was enclosed on all sides by lofty buildings. In laying out open spaces the dank, circumscribed, and "prisony" look general to London squares should be avoided; and the provision of large parks, stiff, flat, and uninteresting (to repeat, said Mr. Street, the words used by the author of one paper read at the Congress of Hygiene) was not at all what he intended; with intelligence a wild space could be transformed to the purposes of a park with great success. At the Congress it had been proposed that before further building was permitted around a congested district a zone of clear space should be provided, and that additions beyond should be in the form of picturesque suburbs; the effect, however, would be to still further augment the value of land at the centre, and to create differences of value of contiguous plots of land to such an extent that it might be advisable to expropriate property in such land and invest it in the State, which should lease and use it for the benefit of the nation. Railways were not to be forgotten, and the author thought that for the different main lines to come to, and round, the city, but not through the city, was better than to have a central railway station. The author had been informed that the consideration of possible developments of cities was wholly visionary; that was hardly a correct view, for they had seen the change made by Baron Haussmann, in Paris, and a great change was now taking place in the chief cities of Italy, where buildings of great archæological interest were being swept away in order to construct big rectangular thoroughfares. The Continental representatives at the Congress of Hygiene approached the subject with much lighter hearts. Herr Lechner, of Buda Pesth, thought the best plan was to pull down the old town and build an entirely new one in its place; while Herr Stubben, the City Architect of Cologne, had urged the establishment of a comprehensive building plan, and had stated that in any future extension of Cologne 5 per cent. of the land would be reserved for parks, another 5 per cent. for plantations in streets and open places, and of the remaining 90 per cent. 60 per cent. would be given to buildings and 30 per cent. to streets. Mr. Street had prepared a sketch showing a type of what might be considered the natural development of a city, the earliest condition being a settlement of a mercantile community upon the bank of a navigable river. As the settlement tended first to spread along the bank, the early form would be that of a portion of an oval with the two centres parallel to the bank, and from that nucleus the town would increase in curves parallel to the original oval, but with roads at convenient intervals leading towards the centre, while provision for open spaces or lungs could be made. Having quoted 45 Vic., cap. 14, sec. 14, with reference to air-space round buildings, Mr. Street said it would strike any one that the provision of practically a strip of open space, 10 ft. wide, at the rear of a building, while it might be sufficient for some buildings, would be manifestly inadequate if the building was of very great height, and, in his opinion, any regulation in regard to open space should have reference to the height of the buildings. The revised regulations, he thought, might be that no building whatever should hereafter be erected of a greater height than the width of the street, and that every building in the rear thereof should have a strip of land belonging to it of a minimum width equal to one-fourth the height of the building; the height of the one-story building to be allowed in the open space should also be limited, 12 ft. to the eaves being the extreme limit. By the London County Council (General Powers) Act, 1890, no building was to be of greater height than 90 ft., and in the Draft Suggestions for a new Building Act, generally assented to by the Institute, that maximum height was reduced to 75 ft., and might, he thought, be further reduced with advantage. Under those suggestions, when streets 50 ft. wide ran in parallel lines, and the buildings were 40 ft. deep, there would be two 40 ft. front buildings, and two 12 ft. 6 in. open spaces; the distance between cross-streets being 105 ft., or 150 ft. from centre to centre. One great blot on that arrangement, however, would be that houses in the main thoroughfare would hinder the access of air to the space at the back of the houses on the cross streets, and therefore there should be a minimum width of 25 ft. between the backs of houses in the main road and the sides of those in cross streets. The Model By-laws recommended a minimum width of 25 ft. for all houses of a height of 35 ft., or more, and if that were generally adopted air-space around buildings would be liberally provided for. With reference to street improvements, the width of 40 ft. seemed to be fixed for subordinate developments, and in some thoroughfares recently constructed the width of 70 ft. had been adopted. Subways should be constructed under all main streets, and the several gas, water, telegraph and telephone companies paying rent for the space occupied by them would practically repay the cost of construction. Wood pavement he considered hardly an unmitigated blessing, while if asphalte were not so resonant it would be difficult to conceive of a better paving. Having alluded to the desirability of getting rid of sky-signs, and of a law to limit the size of the lettering of names upon or above shop-fronts, Mr. Street turned to the question of dwellings for the labouring classes, and emphasised his previous remarks on the want of wisdom in separating the classes, and deprecated the erection of large block dwellings. It had been proved at the late Congress that London, far from being overcrowded, did not accommodate one-eighth of the number of people that was possible on a similar area, as 400 persons could be housed in block buildings on one acre; at present the proportion was 54·4 per acre, and the author thought if the erection of lofty blocks was at all likely to bring about such theoretical limits, that of itself ought to be a sufficient reason for discontinuing their erection. It was difficult to make subordinate streets sightly and interesting, as the architect was generally the last person the enterprising builder consulted, and any change for the better must come from the superior landlord directing the provision of dwelling accommodation, instead of cutting up his land for ground-rents with regard for nothing else. Small tenements might be expensive as compared with blocks, but there might be advantages to counterbalance that of cheapness, and for which the market rate might be higher. A great difficulty was to provide not only light and air, but sunshine, and the provision for it should be one of the considerations when laying out small tenements, while to make them pretty or beautiful required more real genius than in dealing with buildings where the expenditure was less restricted.

The President, in inviting discussion, said the subject which had been dealt with by Mr. Street's paper was one which affected them all more or less. They would all be agreed as to what he had said as to the great evil of breaking up streets, directly they had been paved, to lay a gas-pipe or an electric wire. London and other large towns suffered a great deal from the hideous phalanx of advertisements, and the subject, he was glad to say, had been taken up very ably by Mr. Waterhouse in a letter to the *Times*, referring to the latest stage of the nuisance, viz., that which had taken to the disfigurement of nature. It was bad enough to disfigure towns, but to disfigure the face of nature was a great deal worse.

Mr. Woodward, in proposing a vote of thanks to Mr. Street, said that with regard to the question of increased open areas round buildings, he thought it would be very desirable to repeal that clause of the Building Act which provided that such open spaces were not to be enforced on sites which had been occupied before, in whole or in part, by buildings. The clause was an absurd one, for as the greater part of London had been occupied in whole or in part by buildings, the clause was largely inoperative. With regard to open spaces generally, it was impossible not to mention with gratitude the work that had been done by Lord Brabazon, now Earl of Meath, and his Society in connexion with open spaces for London. With regard to the provision of open spaces in the laying out of new districts, our forefathers had excellent ideas, as might be seen more particularly in the West Central district of London. With regard to Sir Christopher Wren's plan for the rebuilding of London after the Great Fire, he had always thought it was greatly to be regretted that his proposal for providing an open space along the bank of the river had not been carried out. It was also very much to be regretted that, through the neglect of the local authorities, the intentions of those who laid out Marylebone-road had been frustrated of late years by the erection of buildings which considerably encroached upon what would have otherwise remained a splendid line of thoroughfare. Mr. Woodward next referred to the street projects of the London County Council, which, he said, had been hindered and would be further delayed by the impossible proposals for "betterment" which were attached to them. He also alluded to the great desirability of opening out the Mall, in St. James's Park, to the Strand, an improvement which had been promised by two successive Governments, but which had not yet been accomplished. He next contrasted the areas of open spaces in Paris, Vienna, and London, by saying that in Paris there was a provision of one acre of open space to every thirteen inhabitants; in Vienna, one acre of open space to every 100 inhabitants; and in London one acre of open space for a thousand. In conclusion, he said he was sorry to find that there was any disposition whatever to decrease the height of buildings. The height of a building depended upon the width of the thoroughfare, and in his opinion 90 ft. was not too high for a building in a wide thoroughfare. The height of the Foreign Office in Whitehall was about 90 ft. to the balustrade, and he thought that those who knew the building and the thoroughfare would not say that the building was too high for so wide a thoroughfare.

Mr. Lewis Angell said that Mr. Street's paper might be likened to a dream of fair cities; but the author did not seem to have very great faith in his schemes, for he quoted George Eliot's remark that one could not make an almanac for the millennium. Reference had been made to what had been done in Paris, where, under the Empire, the Works Committee practically consisted of the Emperor, the Prefect, and the Architect. Napoleon discovered Haussmann at Bordeaux, and Haussmann brought with him to Paris the late M. Alphand, and their labours succeeded in making Paris the pride of France, the delight of the English, and the heaven of the Americans. A modern and artistic London like the new Paris, the new Berlin, or the new Vienna, was impossible under the British Constitution. Continental methods did not fit in with English notions. To paraphrase the famous remark of the late Dr. Magee, when Bishop of Peterborough, England would rather be free than beautiful. After thirty years' experience as a municipal architect and surveyor, he (the speaker) was satisfied that nothing short of a fire on American proportions, or a Japanese earthquake, would bring about any great new departure in town improvements such as had been foreshadowed in Mr. Street's paper. It was very much the fashion just now, in these progressive days, to denounce the great landlords; but an examination of the London estates of the Duke of Westminster, the Duke of Portland, the Duke of Bedford, and Lord Cadogan, would show that it was due to those great landlords that London owed much of the beauty she possessed. With regard to the principle of the radial development of towns, it would be seen, by examining the map of London, that London had really been developed on radial principles.

Mr. Arthur Baker said that with regard to regulating the heights of buildings in relation to the widths of streets, it seemed to him to be a great pity that a hard-and-fast rule should be laid down in the Building Act. He thought it would be much better if it could be arranged that a man should be allowed to increase the height of his building in proportion to the distance at which it was set back from the normal frontage line. He exhibited a diagram in explanation of his views on this point.

Mr. H. Dawson said he thought that there must be some mistake about Mr. Woodward's figures as to the proportion of open spaces to inhabitants in Paris. He should be inclined to think that the acres of Fontainebleau had been included in the calculation referred to.

Mr. McLachlan having spoken,

Mr. P. Gordon Smith, Architect to the Local Government Board, also questioned Mr. Woodward's figures, and he quoted some figures collected by a Mr. Gould, which appeared in the publications of the American Statistical Association. Mr. Gould stated that in London there was one acre of recreative ground,—parks

and such like,—for every 694 people; in Paris he gave it as 495 people for every acre; in Berlin 804; in Edinburgh 246; in Vienna 2,230 people to every acre of open space. In New York it was 999, and in Washington it was 361 people to every acre. He could not help thinking that those figures were more approximately correct than those of Mr. Woodward. Something had been said about blocks of artisans' dwellings, and he thought that there was, generally speaking, an undue crowding of people in such tenements. He had looked over the evidence that was given before the Royal Commission on the Housing of the Working Classes some few years ago, and he was astonished to find one very eminent philanthropic gentleman, who was largely connected with these artisans' buildings, giving it as his opinion that it was not at all out of the way to concentrate as many as a thousand people to the acre in that class of dwelling. For his own part he (the speaker) felt confident that it was a mistake, and we should by-and-bye regret erecting these gigantic buildings in such huge unbroken blocks. He hoped that whatever was done in connexion with that class of building would be towards breaking them up into small groups so as to admit sunshine, and allow the air to circulate freely about them.

Mr. Edward Bond gave it as his opinion, after paying some attention to the question of providing dwellings for the working classes, that block dwellings could not be dispensed with, for a certain number of working people must always live in town, and he contended that it was quite possible to healthily house people in such dwellings. He referred to the great evils of the continuous spreading-out of the area of London suburbs with cottage dwellings, a process which rendered it more and more difficult every year for a dweller in the centre to get a glimpse of the country.

Mr. Thomas Blashill, Superintending Architect to the London County Council, said that if one could buy a tract of country and lay out a town upon it, one could not ensure that it would "catch on." Populations were very capricious; they would settle themselves where they liked. The practical point really was, to see that where large numbers of people congregated together each house should be built in a satisfactorily healthy manner. Of course there were questions with regard to streets. Streets were made partly as thoroughfares and partly as frontages to houses. We had a good many regulations with regard to these which were not perhaps so useful or so stringent as they might be; but the public were exceedingly impatient with restrictions. Some of the speakers had been very liberal in their notions of what ought to be given up by private owners to the public; but when they appeared in Court or in other places where he was himself sometimes visible, and when the question was as to what their clients should be allowed to do upon a particular plot, they were entirely different in their tone. There must be some humour in life to make it tolerable to men like himself, and he must say he enjoyed that kind of thing immensely. But was it not common sense to let people exercise their own free will, using restrictions only so far as might be necessary for the good of the individual and of the public? He was disposed to think that those regulations which we had for open spaces and general arrangements with regard to new buildings must sooner or later be applied to old buildings; for, if they were necessary for the new, they must often be even more necessary for the old sites.

The vote of thanks having been carried by acclamation,

Mr. Street briefly replied, and the meeting terminated.

TESTIMONIAL, WEST HARTLEPOOL.—On the 2nd inst., Mr. D. Robinson, Chief Foreman of Works, was presented by the officials, workmen, and others, with a 12 in. level, tripod, and staff, a writing-desk, set of carvers, and a tea service for Mrs. Robinson, upon his leaving West Hartlepool to take up the duties of District Surveyor to the County Council of Derbyshire. The presentation was made by the Borough Engineer, Mr. J. W. Brown, A.M.Inst.C.E., who congratulated Mr. Robinson on his success in obtaining his new appointment. He stated that the West Hartlepool Council were so satisfied with the conduct and abilities of Mr. Robinson that they had offered to increase his salary by 50 per cent. if he would remain with them. Mr. Robinson, however, while appreciating very highly the compliment paid him, declined the offer.

THE ARCHITECTURAL ASSOCIATION.

AN ordinary meeting of this Association was held in the meeting-room of the Royal Institute of British Architects, 9, Conduit-street, on Friday, the 2nd inst., Mr. H. O. Cresswell, President, in the chair.

The following gentlemen were elected members:—Messrs. W. E. Sedgwick, W. R. Davidson, H. C. Trimnell, C. Perks, and A. J. R. Ley.

Mr. John Brett, A.R.A., read a paper entitled "Daylight in the Dwelling House," which we print *in extenso* on another page.

The President, in inviting discussion, said that no words of his were necessary to emphasize Mr. Brett's concluding words. The subject which he had brought before the meeting was one which was deserving of their earnest study and consideration.

Mr. Paul Waterhouse said he had much pleasure in proposing a hearty vote of thanks to Mr. Brett for his interesting paper. It was not every day that they got a specialist to give them so many hints on subjects of so much importance to them. There were many points in Mr. Brett's paper which, as he would be fully aware, might be considered open to question. Indeed, it would be a poor compliment to him, after he had thrown a controversial bomb amongst them, to meet it with a mere "Thank you." He had suggested to them a course of action on certain points which might lead them astray. The theory, for instance, that any lot of windows could be made into an elevation was, he thought, one which might be misunderstood. They knew that elevations owed something of their harmonious composition to windows, and he thought that perhaps at the present day they were too ready to allow themselves the liberties of the picturesque. There was one point to which Mr. Brett alluded which seemed to him to be very important, viz., the extraordinary difficulty of hanging works of art, with any effect, upon a wall opposite to a window. No doubt they knew the splendid collection of pictures by Mantegna which were exhibited at Hampton Court. There was a whole gallery of them, and it was impossible to see them, for they hung opposite a series of large windows. It was quite impossible to see them properly, although there was plenty of light. He believed that thousands of pounds had been spent in providing means for taking these pictures out of the room in case of fire. Mr. Brett had advocated that there should be only one window to any room, and for his purpose, viz., for the proper exhibition of works of art, he was no doubt quite right; but if they had a room of the shape which Mr. Brett particularly recommended,—a room with a window in the centre of one of its shortest sides,—such a room would not be a convenient one to work in, nor would it be always suitable for living in. It was a great convenience in many rooms to have a second window. In regard to drawing-rooms especially (which were often placed at the corner of a building, with two external walls), while it was desirable to have a south aspect for a bright light, why should the occupants of the room be deprived of their sunsets by the absence of a window on the west side of the room? If Mr. Brett would excuse him for saying so, he thought he was a pessimist about looking out of windows. There were plenty of views, even in London, which were worth looking at from a window. As to ceilings, there were many ceilings of the Adam period, for instance, which it was a relief to look at occasionally. As to what Mr. Brett has said as to adhering to symmetry, he quite agreed that there were a great many houses in which they laid too much stress on symmetry; but at the same time it was so much a part of the traditions of architecture that certain buildings, especially town buildings of a monumental character, should adhere to certain rules, of which symmetry was one, that they could hardly give it up. In country houses, of course, they might very well lay aside symmetry, so far, at least, as the exteriors were concerned; but at the same time there were a great many houses in London and other large towns in which it would be impossible to throw over symmetry.

Mr. E. Woodthorpe said he had much pleasure in seconding the vote of thanks. In a town like London it was, no doubt, a very charming thing to have the walls of houses covered with pictures, but for his part he preferred sunlight to anything. When one came down to breakfast and saw the sunlight coming in at the windows it seemed to give one life for the whole day. He knew a very eminent architect who said to him years ago that he should prefer a sunny office to a north-lighted one: it seemed to cheer one up so much. With regard to what Mr. Brett had said as to a single-light room giving one a much clearer definition of the face, he was very doubtful whether the result was as good as when there was a diffused light. He had seen a great many portraits by painters of very beautiful women, but he had very rarely seen one as beautiful as a woman herself, and he thought that was because the lights and shadows thrown upon the face in the artist's studio were so strong. He thought it was much pleasanter to be in a room where there were two windows, because the light was not so strong. He thought that what Mr. Brett had said about the white table-cloth rather upset his own theory, for the white table-cloth was useful from its power of diffusing light, and in lighting the face underneath the eyes, which was, he thought, the perfection of lighting; in fact, the table-cloth served the same purpose as the foot-lights on the stage. Nothing was more cheerful than a breakfast-room with two windows with different aspects, especially in the country. He liked pictures very much indeed, but he preferred the landscape itself to any picture. As to the colouring of ceilings, he had seen just lately some churches in Genoa where the architecture had been utterly spoilt by the mass of colour. In the Church of the Annunziata, which was a magnificent building, one could hardly see any outline of the architecture because the reflections from the gold and colour and the marbles were so strong. His only feeling on the subject of windows was that he preferred sunlight in the house to anything else.

Mr. Sydney Vacher, in supporting the vote of thanks, said that there was one thing which Mr. Brett seemed to have overlooked, viz., that a dwelling-house was a place for people to live in. It was necessary that rooms should not only be made beautiful by the things which they contained, but that they should be healthy and cheerful rooms to live in. A perfectly square or oblong room was not the ideal of a cheerful room. The ideal cheerful room was the room in which the walls were broken up by bay windows and other recesses. He had often noticed that in an oblong room, where there was often only a small window at one end, the walls at the further end were to some extent in darkness. With regard to the use of coloured glass in windows, his (the speaker's) advice was that if they must put coloured glass in the windows of their dwelling-houses let them, for goodness sake, abstain from putting it in the windows of the living rooms.

Mr. Matthew Webb said that while, as a painter, he would, of course, desire to see pictures in dwelling-houses as well lighted as possible, he thought that at the present time there was rather a tendency to go to extremes on the question. In many houses now it was customary to erect what was practically a small picture gallery, top-lighted, where the pictures were hung by themselves. He much preferred to see pictures hung on the walls of rooms; at the same time he was quite aware that the utility and comfort of a room ought not to be sacrificed to the pictures. By all means let the rooms be made as suitable as possible for the exhibition of pictures, consistently with their other uses. In times past, when easel pictures were no less precious than now, they were doubtless hung on walls where they could be seen; but so far as he had observed no special means had been taken for their exhibition in the planning of the rooms themselves.

The President, in putting the motion for a vote of thanks to Mr. Brett, said they were all very much indebted to that gentleman for coming down and giving his views to them on so important a subject. Although he had criticised architects rather freely, he thought he had let them off pretty well. Of course the painter was apt to look upon a house to a great extent as a shrine for his pictures, and he only fell foul with the arrangement of a house when he found that the rooms were not suitable in all respects for the exhibition of pictures. But Mr. Brett had looked upon a house too much from one point of view. Now, so long as Mr. Brett was building for himself and was his own client, he could, of course, plan his house to meet his own views; but when an architect was building for a client he was bound to consider the essential requirements of his client. People

in the country, for instance, would not thank any architect who, in order to satisfy Mr. Brett's ideas, should fail to provide them with windows giving them the best possible views of the country. It would be of no use for an architect to tell his client, in such a case, that he must only have one window to any room, and that that window must be placed high up, for people would insist upon being able to look out of their own windows, and they even wanted to do so while sitting down. Mr. Brett had alluded to the unfortunate mistake which had been committed in regard to the tapestry of Exeter College Chapel, Oxford, but the architects were not responsible for that. He had, personally, been very much interested in what Mr. Brett had said as to the setting of the subject of the Royal Academy Gold Medal for Architecture (a large town house suitable for the exhibition of pictures). He was one of the unlucky men who went in for it, but Mr. Brett's strictures did not affect him, because his drawings were never hung, it having been considered that he had infringed the conditions laid down.

The vote of thanks having been carried by acclamation, Mr. Brett briefly replied, and the meeting terminated.

DAYLIGHT IN THE DWELLING-HOUSE.*

It has been said by some modern philosopher (a German, I think) that it is not necessary to be an architect in order to live in a house, intending thus to set forth that a given theory may be a good and useful framework for your ideas although you did not yourself invent or develope it.

The Committee of your Association seem to countenance a variation of this aphorism by inviting a painter to read a paper to you this evening. They do not thereby imply that a painter can be an authority on architecture, but that he may, perhaps, know one or two things about the lighting of a house that are not usually learnt in architects' offices, but which yet may have some practical importance.

You architects lay yourselves out to be serviceable to all sorts and conditions of men,—you build for "the butcher, the baker, and the candlestick-maker," and you have it in your power to make their lives pleasant and their home a "desired haven," or, on the other hand, to fill that refuge with "wailing and gnashing of teeth." No other profession in the world has such control over the destinies of men in general, but specially of painters, so I feel sure you will good-naturedly consider their wants before you put in your windows.

We shall all readily admit that the first requisite for a dwelling-house in this climate is that it should keep out the weather; and I think it can easily be shown that the next essential quality is that it should let in the daylight (when there is any). Like most things, the letting in of the daylight may be well done or badly done, and there are more ways of doing it badly than well, so that if left to chance it is likely to prove a failure.

I propose to explain in the first place what good lighting means, and how the windows should be placed so as to enable you to see things well inside the house. My next endeavour will be to show how the daylight having been admitted can be economised and utilised by reflection, and that the artistic treatment of the interior largely depends upon reflected light and on the quality of the reflecting surfaces.

You can have a very comfortable life in a tent. A tent, indeed, has charms for enterprising men second only to those of a ship,—the ideal home of the Englishman, whose estate covers the whole surface of the sea. A tent can be quite comfortable and safe even in howling gales of wind or drifts of snow, and a considerable portion of mankind for generations have found tents quite good enough for common purposes—to eat, to sleep, and to die in. But civilised man has a want which a tent cannot supply,—viz., a place for the exhibition of his treasures, especially the treasure of beauty, for which stability, permanence, and good daylight are wanted. He also requires a base of operations for his enterprises, a museum for his archives and trophies, and, above all, for the convenient arrangement of his intellectual resources,—for his books and his pictures. He may also require means for the entertainment of his neighbours and his children, and for seeing them to the best advantage.

If you can admit that a painter knows anything you may be sure he knows how to light a picture so that its merits may be well seen, and I think it will not be difficult to convince you that the lighting of pictures is an excellent criterion of the lighting of the house,—indeed, a very crucial test of it; but it is evident from our daily experience that many architects have never heard of such a principle, and will exclaim with certain disciples of old, "This is an hard saying. Who can hear it?"

Now, it is not practicable to build for a single individual; you must build also for his guests and for the public. Your client may be the most ignorant vestryman in the three kingdoms, but he will not owe you any thanks if you work down to his own personal level. Even if he devotes his whole life, say, to the choosing of bacon or cheese, he will still like to leave behind him when he dies such a house as shall have the approval of the more cultivated men of his day. Therefore you must provide for the housing of works of art, although they are not mentioned in the specification. When you have done your best the house is sure to have defects. Some of these will probably carry with them compensating advantages, and some can easily be lived down by a philosophical tenant; but defective lighting you will find very difficult to deal with, and in most cases incurable.

Daylight is more or less necessary for our physical health, for cleanliness, for the preservation of our possessions from damp, from mildew, and other enemies, but it is indispensable for the seeing of beauty. A large quantity of daylight is not the chief consideration. A glass house or a lantern is eminently unfit for a human dwelling, since snugness is a most desirable quality, and for your banquets artificial light is better than natural daylight, as I will explain later on.

The most common form of beauty harboured in houses consists of pictures. I use the word pictures in a broad sense, comprising all such beautiful things as can be shown on the walls. I do not refer to the great art of sculpture, because that is considered by many of us as an essential part of architecture. It is well known that in the great period of Greek history the pictorial art flourished, and in the fourth century B.C. what we call easel pictures formed a considerable item in the wealth of Athens. These pictures were mostly carried off by the Romans, many of them changing hands at incredibly long prices. The competition amongst collectors was as brisk then as at any time in the Victorian era. This taste, therefore, is no mere modern fashion, and in our own day it may be said to be universal, so that it would hardly be possible to find a poor cottage, even in remote parts of Wales, where there are no pictures, whilst in London they have come to be a favourite form of wedding present among the wealthy.

The daylight under which pictures can be well seen may be either direct or reflected. If direct, it should *not* fall normal to the surface. It may come from the right or the left or from the top, but it must not come from behind the spectator, for two simple reasons. The first reason is that his own shadow will fall on the field of view, and the second that the surface of the picture will shine. So that the wall opposite the window is not a picture wall.

The aspect of the window is not of much consequence, for although direct sunshine kills delicate colour, and is not adapted to show anything well, it can generally be diffused sufficiently for most purposes by a blind of fine texture, and the architect is not much concerned, because the exigencies of the site and the plan will already have determined the aspect for him. The subject of skylights may be put aside for the moment, and windows taken to mean perpendicular openings in the wall. The placing of them should be decided simply on utilitarian grounds, that is to say, how the most wall space can be well lighted.

External appearance need have no weight in the argument, for a man who cannot make any possible windows compose well in the elevation is not an artist at all, and, therefore, not an architect. I may even go so far as to say that the more irregularly, unsymmetrically, and arbitrarily they are placed the more scope there will be for developing a picturesque building.

From an outside point of view, that is as far as the public are concerned, picturesqueness is the happiest attribute to be hoped for in a domestic building, since it will seldom be large enough to have any claim to sublimity or impressiveness. But there is this to be said on the other hand, that there is no worse form of affectation than the effort after picturesqueness for its own sake.

In streets or terraces there is not much room for choice in the placing of the windows, so we generally find such houses comparatively well lighted. It is where the phantasy comes in, as in the country-house or the villa, where your architect is rampant, that you may expect to see some artistic flourishes, constructive mistakes, and incurable lighting.

I believe that if you design your house strictly from the inside, and on merely utilitarian principles, a good external effect is inevitable, or can only be missed through a singular degree of ignorance or meanness. Of course, if you are ignorant of construction or if you want to produce a more gorgeous appearance than you can honestly afford, there is no redemption for you; you are bound to fail and to wish that you had never been born, for a mean building is usually destined to encumber the earth, and to disgrace your name for at least ninety-nine years.

Let us at once assume that your client or his heirs will have some beautiful things to grace the inside of their dwelling, and we should not overlook the circumstance that his daughters may be comprised in this category, so we must be careful to light properly this living sculpture, no less than the flat surfaces of the wall pictures.

A happy expression on the human face is largely dependent on reflected light, which concerns surface treatment rather than construction, but the fundamental consideration and root of the whole art of lighting depends on having only one single aperture in the wall, so that the direct rays may all enter parallel, and not in conflicting directions. In artists' studios you will always find this rule carried out, and I will now attempt to explain the reason for it.

Let us suppose you have to draw a portrait. A single high-light on the head involves a shade in exact proportion to it which you, as a draughtsman, can supply without any chance of error. The cast shadow likewise will have a known well-defined and inevitable relation to the shade. This simplicity of light and dark enables you easily to grasp the form, and to appreciate its undulations without uncertainty or confusion; whereas, if you have two sources of light allowing rays to enter in two different directions, not only will you get on your model two high lights in inconvenient rivalry, but all your shades will be complicated and put out of their normal relation to their lights.

The unity and simplicity of one shadow will be marred by the intrusion of another, and the result will be that your apprehension of the real undulations of the surface and the beauty dependent on them will be hindered, and considerable spaces of the surface will have no meaning for you,—the beauty revealed by one ray of light being neutralised or blotted out by others proceeding in a different direction, so that the seeing is very considerably impaired, and the form shown at disadvantage.

This is one important argument in favour of establishing only one inlet of light in each room. But there is another argument even more important, because it affects not merely the form of an object, but also its colour and texture; in fact, it fundamentally affects your seeing power. The subjective effect of cross lights is to diminish the pupil of your eye, thus curtailing absolutely your physical power of vision. Suppose, for instance, your room has two windows, one facing south and the other west, you will necessarily enter either on the north or the east sides, since both the others are outside walls. Whichever door you enter by, you will find a window light shining right in your face. You will encounter your visitor, say, in the middle of the room, exposed against the glare of the south window, he telling as a dark patch. This is not the chief mischief to which I am asking your attention, since the light from the west window may show his surface sufficiently well to be recognised. The main point is this: the light from the south window closes up the pupil of your eye so that it will admit only about half the quantity of light that you are capable of perceiving, and the effect upon you is equivalent to depriving you of one eye altogether,—that is

* A Paper by Mr. John Brett, A.R.A., read before the Architectural Association on the 2nd inst., as elsewhere mentioned.

to say, your visual ability is crippled to the extent of one-half, so that whilst you flattered yourself that with two windows your room would be twice as light as if it had only one, this advantage is neutralised by your being disabled from using half the available rays, to which must be added the further disadvantage that your visitor is exhibited under the most unfavourable conditions of light and shade.

In order to use all the seeing power that nature has provided you with, it is necessary that the light should reach your eye *after* having illuminated the object you want to look at, and further, that the pupil of your eye should be encouraged to open to its full size by being shaded from the glare of direct rays. For these reasons, the consulting-physician always places himself in the shade and you in the light.

As all architectural structures have upright walls, such as are very convenient to look at, it is important that they should be well flooded with daylight, so as to show such pictures as you have; and next it is advisable to economise those walls as fields of beauty, and not carelessly cut them up by chasms for doors or fireplaces. Seeing that your house is not to be a mere shelter, or casual-ward, but an intellectual preserve, it is worth while to relegate such interruptions of wall-space as far as practicable to the corners. I know that there is nothing more painful to the soul of the modern architect than a blank wall, and that sleep for him is impossible until he has broken through and destroyed that invaluable area of repose. So mad does it make him that he has been known to build in unnecessary pilasters in order to divide it up. I will venture to remind him that the impressiveness of a building from the outside largely depends on great unbroken areas of wall, and that these may be well studied in Mediæval fortresses, which are admitted to be the most picturesque structures existing in Europe: take for instance the castle of Ivrea in Piedmont.

I think it may be taken as a general principle that any architectural design that is so complete in itself as to forbid the intrusion of the subsidiary arts is not adapted for a dwelling-house. I know a man whose house was finished by Owen Jones. He is very fond of pictures, but has to keep them piled up in stacks for fear of spoiling his walls.

I have noticed that very young architects are instinctively aware of the value of accessories, since in their perspective drawings they do not hesitate to balance a poor lop-sided composition by the introduction of a carriage-and-pair, nor to collect a vagrant assemblage of pinnacles into a group by the judicious insertion of a tree. No doubt, a good house ought to be adapted for an advancing civilisation. We read that Old King Cole's wants were very limited: "He called for his pipe, he called for his glass, and he called for his fiddlers three," but there is a young King Cole now—a being to whom a sideboard, a billiard table, and three fiddles do not comprise all the indoor requisites. He calls for his books, his pictures, and his sculptors three, and if you architects practically ignore or suppress these luxuries, as you have been doing of late years by your abuse of daylight and your ignorance of its application, you will drive your young client to let his new villa for a lodging-house, and to spend his time and cash in foreign travel.

A neighbour of mine is just now building a rather expensive house in the suburbs. His architect is evidently bent on doing something quite original, and amongst other peculiarities he has placed all the day-rooms under a deep verandah made of copper, calculated to keep out all the daylight. The poor client, I surmise, had no idea what the first consequence would be, viz., that he must straightway get rid of such works of art as he had, and abjure every sort of beauty for the rest of his natural life. The unfortunate man will have very long gas bills.

We have arrived now at one well defined and very important rule, which is that the daylight should be admitted to a room on one side only. Of course, every rule may have exceptions. On the east coast of England you will have noticed many little towers, built usually of wood, with an outlook in three directions, viz., up the coast, down the coast, and out to sea. These were wreckers' nests, where dwelt those whose livelihood depended on ships cast away upon that inhospitable coast, and robbery of the unfortunate mariners.

A short time ago I was spending a day at Greenwich Observatory, where the chief day-room had windows to the north and the west. This was one of those rare deviations from my rule that could easily be forgiven, for each window looked out on one of the most beautiful views in England. When you entered that room you never for a moment thought of what was within it, although good taste reigned. You walked straight to one of the windows and remained there. No one could find fault with the judgment of the architect. Here was an exceptional opportunity not to be passed by, even at the cost of an ill-lighted room, for the summer outlook on a paradise was worth some sacrifice. Having resolved on that sacrifice, he could easily afford to violate comfort, as he has done, by a French window, but it opens into an old English formal garden, with quaint apple and fig trees in it, such as would charm the soul of Mr. Reginald Blomfield. These are the only exceptions to the rule that occur to me.

That part of a window which is most valuable is the top half, as it admits most light per square foot. The lower part only admits light reflected from the earth, and more or less coloured; therefore roll-blinds from the top should never be allowed. Any other form of curtain is less mischievous, but a roll-blind should be fixed at the bottom. In a well-lighted house the windows are carried right up to the cornice. Window heads, whether traceried or lancet, may be admirable, but should be reserved for other buildings where people do not dwell. If you ask yourselves the question which rooms are pleasantest of all those you have known, I think only one answer can be given, and it will be this: Those rooms are pleasantest in which work is done. Few would reply, "Those from which you have the best view." The man who would say so must be one whose home is sad, solitary, and unlovely; whose memories are the only beautiful visions on which his thoughts can linger. How often do YOU resort to your window with relish and turn away from it with reluctance? In your town experience I may confidently reply, "Never." If you decide the question by the suffrage of all the fairly cultivated men and women you know, I think the vote would be given in favour of the painter's studio, which has either a skylight or a window too high to look out of. I believe few, even amongst women, would vote for the drawing-room. It does not usually fall to the lot of gentlefolks to spend much time in workshops, but if you have a wide experience you will cherish the remembrance of the days you have spent with the goldsmith, the blacksmith, or the carpenter, and none of those shops were lighted by architects, none of them had any outlook. If you would rather look *out* of your nest than *into* it, then must your life be sad indeed, and you had better get away into the wilderness, or to the top of the Hindu Kush.

There is in the City of Timbuctoo a great town house which illustrates nearly all the blunders that can arise from ignorance of lighting. The Sheik is a man of the utmost good nature and nobleness of soul, and takes pleasure in his splendid possessions just in proportion to the number of intelligent men who will share their enjoyment with him, so I surmise that some of you have been his guests. He has a collection of pictures of first-rate importance, but his ingenious architect has so contrived the interior that hardly any of them can be well seen. The value of some of the pictures is so great that a very few of them would cover the cost of the whole building, yet many of them are condemned to blush in dark corners in order that the architect should indulge his childish taste for symmetry. The principal suite of rooms face the south, and are all lighted in the orthodox way, viz., on their long sides. The opposite long walls do not afford any good lighting, because, as I pointed out, your own shadow and the shine on the pictures conspire to render them invisible; and the gigantic fireplaces occupy about a third of the area even of these walls. The only well-lighted spaces that the plan allowed were the short walls that stand north and south. These he has wantonly and ruthlessly wasted by opening a vast doorway in the middle of each of them big enough for the gate of a city, and so the design was finished.

I think many architects would be surprised if they knew how fine an effect is produced by entering a room at the corner instead of at the side. It must be very unusual, since I do not know more than two or three instances of it. Its charm depends on the varied angles under which the walls present themselves to the eye when you enter, as all of them are seen under oblique instead of parallel perspective, and the suggestion is conveyed that you should go on and prosecute your researches in the ramifications of the structure. You are not confronted by a flat opposing partition right across the line of advance.

All deviations from mere symmetry are dear to the soul of the artist, because they give occasion for composition,—that is to say, the creative faculty,—and if there were no other reason for placing a window out of the centre of the wall, this would be sufficient, but as a matter of experience many reasons for doing so are not far to seek.

There are instances in which one whole wall is filled in with glass, and with excellent effect. There is one in a house very near my own built by Mr. Waterhouse. It is the window of a fine staircase, the other whole walls of which are well lighted and well adapted for pictures; but, alas! the use of stained glass in the window has put this out of the question; and instead of an intellectual feast of fine art, you are indulged with some admirable colour and design in the glass itself, but the walls are wasted.

Let us now turn our attention to the second division of our subject, and determine how to deal with the daylight when we have let it in. This important question is too often shirked by the architect, and shuffled on to a scapegoat called the decorator. This pernicious person has the power of doing immense mischief at small expense, so he does it with no niggard hand.

For a concrete example, let us refer back to the great house in Timbuctoo. The picture-show begins at the dining-room, the walls of which are covered with a rich stamped leather of dark maroon and gold, affording a fine background both for pictures and guests. The decorative mind was just able to grasp this principle, and, knowing there was "nothing like leather," he carried it right up from floor to ceiling, absorbing that part of the wall which is too high above the spectator to be serviceable as background, and destroying its power of reflecting light, which is the only function it could have fulfilled, and would have fulfilled with admirable effect if its surface had been tinted with tempera or an ordinary wall-paper of a cream colour. The ceiling, as usual, is cut up with mouldings and colouring of senseless pattern; but even if it were well designed, he would surely be an odd sort of visitor who would turn away from Vandyck or Sir Joshua Reynolds to gaze at the ceiling. A few sixpenny buckets of whitewash expended on that ceiling would have redeemed the room, and proved that it belonged to an intelligent human being. Whitewash is a by-word with the modern æsthete, but it has its uses.

There are two different conditions under which light can be reflected.

They are known in optics as whole light and scattered light. Whole light advances in one direction only. An ordinary plane mirror reflects whole light. The light called scattered light proceeds in all directions at once, and cannot be focussed by the eye so as to show images. Such is the light reflected from any granulated or dead surface, such as tempera, snow, or sand. If you require a polished surface to reflect light into a dark corner, it will fail to do so unless it is placed at exactly the proper angle, whereas a scattering surface will be efficient at any angle. All surfaces that are not strictly required to do duty as backgrounds should have a scattering surface so as to diffuse the illumination, and the lighter their colour the more efficient they will be for this purpose.

In Italy, unfortunately, there is more or less good art displayed on the ceilings of the great houses. All men who have seen it will agree that it could not have been more foolishly misplaced or more effectually wasted.

The greediness that asks for every surface to be made beautiful is not only a childish greed that wishes all bread were cake, but an immeasurably mischievous one, for there is in every room one surface that can only render good service when kept plain, and so enabled to set off to advantage the beautiful things that are more favourably placed for examination. That surface is the ceiling. The ceiling is an invaluable reflector and economiser of light,

and that is the only thing it can do thoroughly well.

If the economy of daylight by reflection is to be overlooked, all art may be banished from the dwelling, for few things are more painful than the spectacle of beauty wasted. An excellent reflector of scattered light is a white linen cloth. It is well known that people look their best at a dinner-table, and I suppose it has been the practice in all civilised ages to serve the dinner on a "fair linen cloth." When the lamps are alight, a strong reflection is sent up from the table-cloth into the faces of the guests, filling their shady recesses with a warm illumination, and giving them a more or less angelic appearance, or, at all events, putting away the lowering and gloomy evidences of hunger and ill-temper.

Your architect will gladly provide you with good shelter where a horde of menials can eat and sleep comfortably at your expense. Viollet-le-Duc is careful to go further, and provide that you shall look out on the prettiest view, but he calmly assumes that you are sure not to have anything inside your house so well worth looking at as the houses or shrubs opposite, and the historical conclusion of the whole matter is that in the reign of Queen Victoria, in nine great houses out of ten, any kind of art is out of place, for the simple reason that the architects have misused the daylight and wasted the wall-space.

One word more has to be spoken as to the use of stained-glass, and it is this:—If you wish to indulge in stained glass, you must make it your one and only form of colour-decoration. You can have superb colour in your window, but you take away its usefulness as a source of light, and make it an object to be looked *at*, and when you *have* looked at it your eye is unfitted to see any other colour. Even the splendid tints of Eastern embroidery or carpets cannot stand the competition; white light is absolutely necessary for the display of their beauty.

Mr. Burne-Jones lately designed a beautiful picture, and Mr. Morris worked it in tapestry for the glory of the chapel of Exeter College. Some ingenious person has placed it on the same wall with a gorgeous stained-glass window, and opposite to another, so that none of its fine colour can be seen. I need not enlarge on this subject. Once seen, that painful spectacle can never be blotted out of your memory. The colour of your reflective surface is only one degree less important than the colour of your window glass itself.

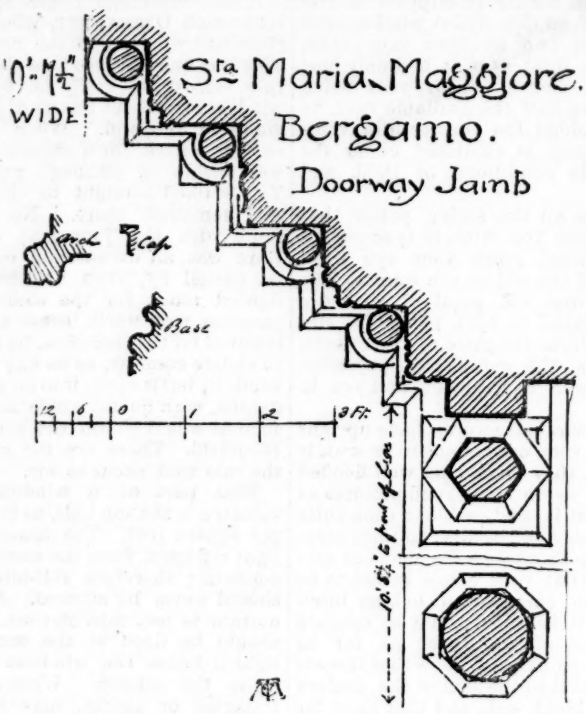
I once knew a physician who had the walls of his consulting-room painted of a strong uniform green. He was quite unaware of its professional advantages, and said he thought it restful to the eye. His decorator had told him so, having doubtless heard that green shades were used by people with weak eyes. As a matter of fact all his patients appeared to have the cholera, and it had to be repainted. A few years ago nearly every reception-room in London was papered with a dull sage green; a sad emphasis to lay on the depressing climate we have to live in, but a good man and a friend of mine was responsible for it.

I am afraid you will think I display an unreasoning animus against the architect, and that I have spoken rashly and at random as to his ignorance of the use of daylight. But that is not so. There is an institution in which I lately offered to endow a prize for the best design for a house in which pictures could be well seen without a special gallery constructed for the purpose. The Council were pleased with the idea, but, scorning my modest 25*l.* a year, made it into a handsome 200*l.* Two or three distinguished architects were appointed to judge the competition, and they actually awarded the prize to a design which afforded not one single well-lighted wall in the whole structure; and yet none of them were aware that they had done anything ridiculous.

There is a good deal to be said as to skylights in lighting the dwelling-house, but you have probably heard more than enough on the sacredness of the wall and the importance of one window. Allow me to suggest, in conclusion, that these matters are worthy of your most serious study.

[Some notes of the discussion which followed will be found on another page.]

Fret Saw.—The managers of the Britannia Works, Colchester, call attention to an improvement in their "No. 8" fret saw by the addition of a new means of tightening the saw after it is fixed, and also by the addition of a boring appliance.



THE LONDON COUNTY COUNCIL.

A special meeting of this Council was held on Thursday, the 1st inst., the Chairman, Mr. John Hutton, presiding.

The Proposed Taxation of Ground Values.—The discussion on the question of the taxation of ground values was resumed, and after several amendments had been discussed and defeated, Mr. Stuart's motion, as printed in our last, was agreed to.

The ordinary weekly meeting of the Council was held on Tuesday last, the Chairman of the Council again presiding. The greater part of the sitting was devoted to the renewed discussion of the subject, and to some further proposals of the Local Government and Taxation Committee, but no conclusions were arrived at, and the further consideration of the proposals was adjourned to a special meeting summoned for Friday, December 9.

The New Works and Stores Committee.—One of the items on the agenda was the election of six members who, together with the twenty-four members nominated by committees, are to form the new Works and Stores Committee. Dr. Collins said he was sorry to find that out of the twenty-four members already elected, only two belonged to the party on the Council to which he had not the honour to belong. He, therefore, moved that the following members of the "Moderate" party be elected to the six vacancies in the committee:—Alderman Beachcroft, Mr. Boulnois, the Duke of Norfolk, Mr. Buxton, Mr. Westacott, and Colonel Hughes.

Alderman Beachcroft said he regretted having to decline the honour, his time already being fully occupied. Messrs. Westacott, Buxton, and Boulnois withdrew their names for the same reason, and the Duke of Norfolk withdrew his for the reason that he had "neither the knowledge nor ability to qualify him for service on the Committee." Colonel Hughes, M.P., objected to serve for two reasons,—the first was that he did not belong to the "Moderate" party, and the second was that he was already overworked.

Mr. Nathan Robinson asked whether he would be out of order in appealing to some other members of the "Moderate" party. Surely there were some of them who had some ability? It looked almost like a conspiracy to avoid serving on the Committee.

Other members of the "Moderate" party were appealed to, but all declined to serve, and in the end the following members were elected:—Messrs. Arnold with 69 votes; Stevens, 58; Sheffield, 51; Hood Barrs, 47; Freake, 43; and Tarling, 38.

After transacting other business, the Council adjourned at seven o'clock

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The Slade Professorship of Fine Art at University College.—It is stated that Mr. Fred Brown has been appointed Slade Professor of Fine Art at University College, London, in succession to Prof. Legros, resigned.

Illustrations.

BRONZE DOORS, ADELPHI BANK, LIVERPOOL.

THE bronze doors and grille illustrated have lately been erected at the main entrance of the new premises of the Adelphi Bank, at the corner of Castle-street and Brunswick-street, Liverpool.

They were designed by the architect of the bank buildings, Mr. W. D. Caröe, and the figure sculpture is from the hand of Mr. T. Stirling Lee.

The general work in connexion with the doors and grille was executed by Messrs. Starkie Gardner & Co., of Lambeth; the metal casting of the panels and statuettes being entrusted to Mr. Bubrer, of Chelsea, who employed the *cire-perdue* process, from wax models prepared and worked upon by the sculptor.

The doors are fitted with a lock specially devised by the architect, and executed by Messrs. Chubb & Son.

The figure subjects were suggested by the name of the bank, and illustrate acts of devotion of well-known "Brethren" of tradition:—

1. David and Jonathan: "Jonathan's warning to David."
2. Achilles and Patroclus: "Achilles mourning for Patroclus."
3. Castor and Pollux: "Guiding the Argonauts."
4. Roland and Oliver: "Orlando (Roland) rescuing Oliver:" the last incident being drawn from Shakespeare's "As You Like It."

The drawing was exhibited at the last Royal Academy Exhibition.

CHAPEL, RIDLEY HALL, CAMBRIDGE.

This chapel was erected last year (along with a students' block) from the designs of Mr. William Wallace, the style being the same as the original buildings at Ridley, which were designed by the late Mr. Luck.

Stalls are provided for fifty-four students and the principal and vice-principal. All the internal fittings and roof are of wainscot oak.

Red Ipswich bricks are used for the walling, with Ancaster stone dressings.

The corona of the angle staircase turret is executed in English oak, with a copper covered cupola.

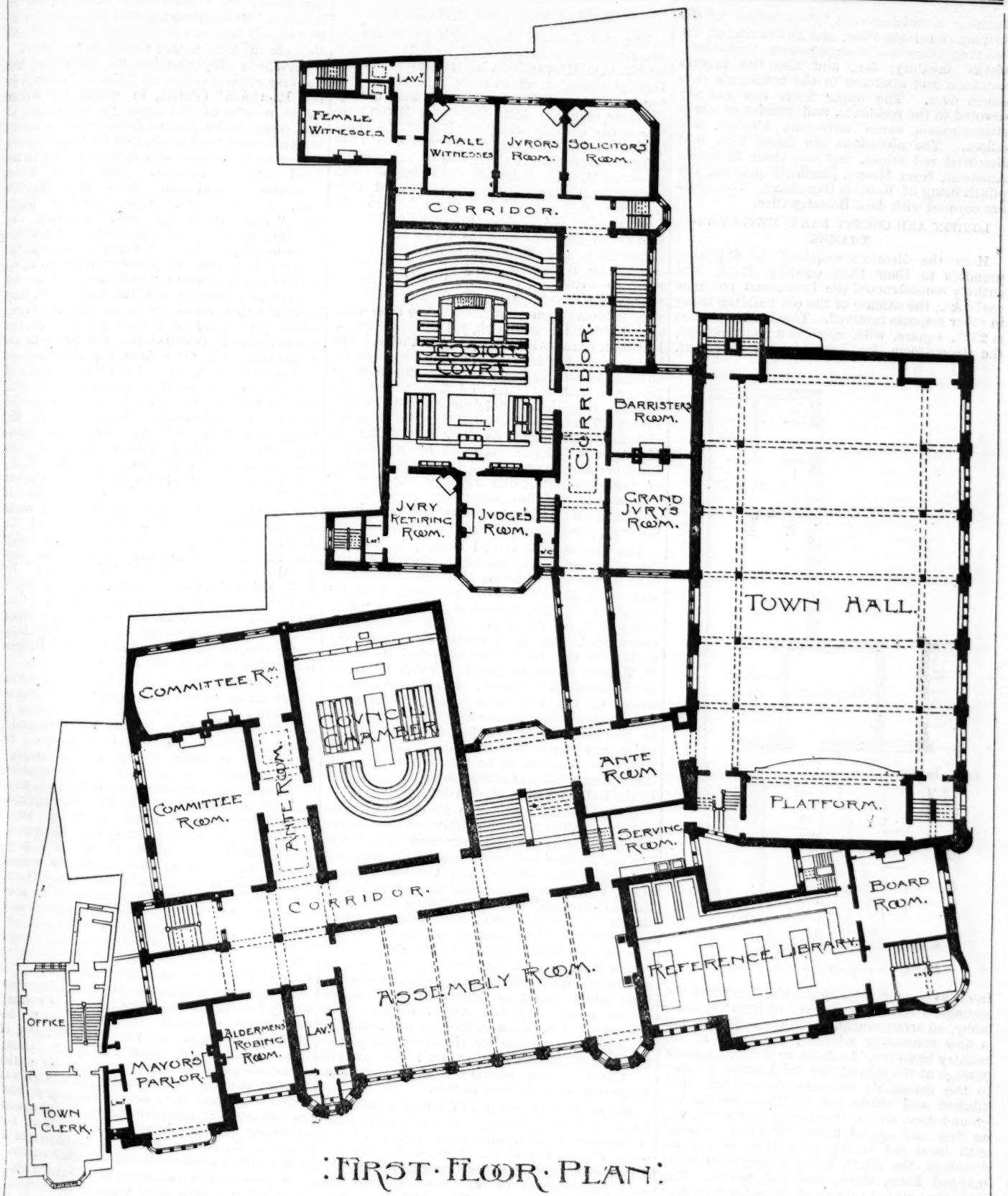
All the windows are filled with stained-glass representing the Early Teachers of the Church.

The whole of the works in connexion with the chapel and students' block were carried out by Messrs. Holloway Brothers. The stained-glass was by Mr. Newbery.

The drawing was exhibited at the last Royal Academy exhibition.

THE SOUTH PORTAL OF SANTA MARIA MAGGIORE, BERGAMO.

In a north-easterly direction from Milan, is situated Bergamo, divided into the New Town



Competition Design for Oxford Municipal Buildings: Plan.

and the Old Town, the latter beautifully situated on the hills, and called Bergamo alto or Città.

In a prominent position behind the Broletto stands the Church of Santa Maria Maggiore, a north-Italian example of Romanesque erected in 1173.

There are two very fine portals to the north and south sides of the church. That illustrated is the portal to the south side.

The simplicity of its parts, and the well-judged scale between the frieze formed of saints in niches and cusping under, and the lower part of the design, has produced an effect both dignified and monumental.

In the receding planes of mouldings in the jamb, the Gothic influence is apparent, though the mouldings are flat and delicate in section, rather than deeply undercut. A plan of the jamb of the doorway is added.

The use of the sculptured lions and kneeling figures behind, under pillars, performing a structural function, probably might not be sanctioned as the strict use of sculpture in conjunction with architecture, yet a certain element of charm is the result, which one could have wished had been attained by other means; but, taken as a whole, the portal displays a satisfying breadth of design.

The drawing was exhibited at the last Royal Academy Exhibition. T. MACLAREN.

DESIGN FOR CITY OF OXFORD MUNICIPAL BUILDINGS.

THE geometrical drawings of this design were submitted in the preliminary competition, the perspective being prepared later for the Royal Academy Exhibition.

The general arrangement of the principa rooms is shown on the accompanying plans, al the offices and police-station being on the ground-floor.

Ford stone was proposed for the external walls, with stone-slate roofing. T. D.

TWO COUNTRY BANKS:

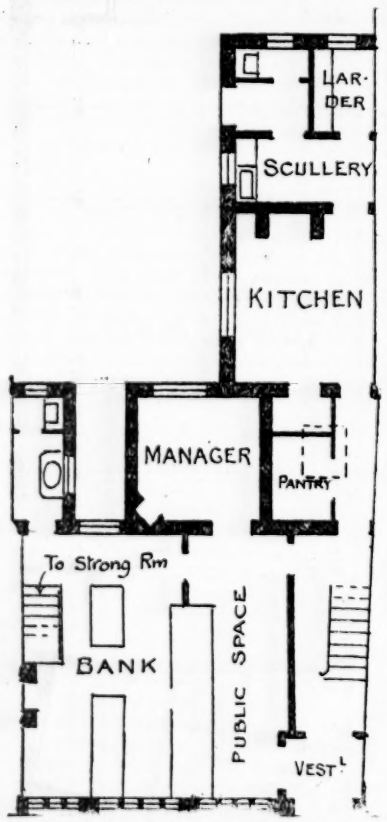
LONDON AND COUNTY BANK, HIGH BARNET.

THE existing premises of this Bank having been found inadequate, the directors have acquired a new site at the corner of the High-street and Park-road, and are erecting thereon entirely new premises, at a cost of some 4,500*l*. The banking office on the ground-floor, 30 ft. by 27 ft. 6 in., provides accommodation for some fifteen clerks, and will be fitted throughout with American walnut. An arched recess,

forming a waiting-room, gives access to the manager's private office, and at the rear of the banking office are a strong-room, book-room, clerks' lavatory, &c., and also the private entrance and staircase to the manager's residence over. The upper floors are entirely devoted to the residence, and consist of three sitting-rooms, seven bedrooms, kitchen, and offices. The elevations are faced with best Bracknel red bricks, and the stone is brown Ancaster, from Messrs. Lindley's quarries, the plinth being of Kentish Rag stone. The roofs are covered with dark Broseley tiles.

LONDON AND COUNTY BANK, HENLEY-ON-THAMES.

Here the directors acquired the adjoining premises to their then existing Bank, and entirely reconstructed the front, and put new roofs, &c., the carcase of the old building being in other respects retained. The banking office is 25 ft. square, with manager's room behind, the strong-room, &c., being in the basement.



Bank, Henley-on-Thames. Plan.

In order to economise space, the Bank and the manager's residence are entered from the same lobby, an arrangement which answers well, and is now constantly adopted, especially at the country branches. In this way the long narrow passage at the side of the Bank office, leading to the manager's staircase, is avoided. The kitchen and offices are in this case on the ground-floor, and sitting-rooms, bedrooms, &c., on first and second floors. The front is faced with local red bricks, with Ham Hill stone dressings, the plinth being a combination of snapped flints, stone, and red bricks. The roofs are covered with dark Broseley tiles, and the half timbering is coated with carbolineum.

The total cost of the works was 1,400*l.*

The general contractor at High Barnet is Mr. W. M. Dabbs, of Stamford Hill, and at Henley-on-Thames Mr. J. Weyman, of Market-square. Mr. G. G. Woodward has acted as clerk of works, and the architect is Mr. W. Campbell Jones.*

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.—On the 3rd inst. fifty students attending the architectural and building construction classes of this college (Mr. Charles Gourlay, lecturer) visited Hawkhead Asylum. The party were conducted by Mr. Crawford, clerk of works, through the main portion, which is just being built, the farm-steading, which is nearly finished, and finally the quarry on the estate, whence some of the stone is being obtained.

* That the plans of both these buildings, that given in the text, and that on the lithograph, are without scales, is the architect's omission and not ours. Plans for publication should always be accompanied by clearly-figured scales. To write on the plan "¼ in. scale" is of no use, as the scale is in most cases necessarily altered in the reduction of the plan for publication.—ED.

MAGAZINES AND REVIEWS.

The *Art Journal* starts with an article on Mr. Ernest Parton, illustrated by a fine etching by Mr. C. O. Murray from his landscape "When Daylight Dies," in which there is something of the sentiment of Corot, expressed with a very different manner. Miss Hepworth Dixon continues her consideration of "Recent Fashions in French Art," dealing in this article with the religious mysticism in the guise of modern life of which M. Béraud has set the example. The article is illustrated by engravings of that painter's "Descente du Croix" and M. Lhermitte's "L'Ami des Humbles," a kind of leaf out of Béraud's book (as far as the idea is concerned), and M. Flameng's very different work, "Le Repos en Egypte." Mr. W. Shaw Sparrow writes on the revival of Art Guilds, recognising that the state of art and society is very different from what it was in the time when such guilds did most flourish, but urging nevertheless that, once revived, they would thrive. The last paragraph of his article, on the unrecognised sources of artistic inspiration in the fields of labour, is both eloquent and true, and should receive attention. "Bolton Abbey in the Present Time" is illustrated by some pleasant sketches to an article by Miss Louise Berens. Mr. Aylmer Vallance continues his articles on furniture and decoration of the house, treating of "window-blinds, lighting, and accessories." The article includes some very good bits of design, some of them by the author, though, by the way, we do not see one of a window-blind.

The drawings of Daniel Vierge, in illustration of Quevedo, are treated of and illustrated both in the *Art Journal* and the *Magazine of Art*. The latter periodical has a very interesting article by Mr. Theodore Watts on "Portraits of Lord Tennyson," of which many are reproduced, and it is remarkable how very various is the impression conveyed by them. M. Viccars continues his illustrated notice of the Leicester Art Gallery. Mr. Claude Phillips writes on the French sculpture of the year, among the illustrations to which we are glad to see he includes the fine and imaginative "Doorway" by M. Bartholomé, with two figures in it with their backs to the spectator, which was the only piece of sculpture of much account in the last Champ de Mars Salon.

In the *Fortnightly Review* Mr. Walter Crane writes on "The English Revival of Decorative Art." There is nothing very new in it, but it is a picturesque and racy sketch of the progress of taste in decoration during the last generation. Mr. Crane touches on the formation of the Art-workers' Guild, reminding the reader that it was a recoil from the unsuccessful effort to induce the Royal Academy to take up decorative art as a part of its annual exhibitions. We fear it is hopeless to expect that such a step will be taken by the Academy, though it is the body which ought to represent "art" in the widest sense, and not merely painting and sculpture. Mr. Crane makes one suggestion in regard to the reason for the dearth of public works of art in this country, viz: the strength of the domestic sentiment in English life. There may be something in this.

Harper's is altogether a "Christmas number" *i.e.* a number consisting of readable and rather sensational stories, the only touch of art coming in in the shape of an article by Mr. Theodore Child on "Some Types of the Virgin," with illustrations of various heads of the Virgin from old masters. The article is original and scholarly, and worth reading. In the course of it the author well remarks that "each great Madonna represents a state of soul; the mystic and tender soul of the painters of Siena; the complex intellectuality of the soul of Botticelli; the seductive grace of the soul of Raphael, more intelligent than creative; the epicurean refinement of the soul of Leonardo. . . . the classical metempsychosis of Mantegna, who seems to have resumed that tradition of primitive Christianity which identified the Virgin with the ideal Roman matron, if not with Minerva herself."

The *Century* includes an article by Mrs. Van Rennselaer on "Picturesque New York," which like London, has more elements of the picturesque than is generally supposed. The illustrations are by Mr. Mielatz and Mr. Manly. That of Madison-square on a rainy night, with the lofty blocks of buildings dimly seen through the rain, is fine; and the sketch at Coenties Slip shows that New York too has its picturesque old dock buildings with a varied skyline. Among "Topics of the Time" are a few words on "Government Architecture in America," strongly urging that important buildings should be given to eminent architects and that official architecture should be abolished.

Scribner's Magazine has an interesting but not very critical article on "Mural Paintings at the Panthéon" (Paris), in which the writer seems to be so carried away by admiration of the spirit of the French Government in carrying out such a work at all, that he forgets to see the serious mistake of carrying it out on no fixed artistic scheme. The same artist contributes, conjointly with Mr. Kenyon Cox, a short and most sensible paper on "The Nude in Art," showing the absolute necessity of the study and practice of nude subjects for the highest development of art; and while they assert (and we agree with them) that mere "nude studies" are for the studio alone and not for the public, they point out that unless some artists gave themselves principally to ideal nude subjects the whole power of constructing the figure in art would languish. Of course the chief reason, that the human figure is the highest means of abstract expression in art, is not overlooked. The article is illustrated or accompanied by two fine pictures, "Narcissus" by Mr. Low, and "Lilith" by Mr. Cox, showing the practical power of the two writers to handle the subject. Mr. F. D. Millet writes an article on "The Decoration of the Exposition" (Chicago), in which there is the usual preposterous trumpet-blowing about the architecture, but a good many of the illustrations of the decorative work are really fine and interesting; among them we may mention the painting of "Needlework" by M. J. Alden Weir (in the Manufactures building), "Keramic Painting," by Mr. Kenyon Cox, "Forging" by Mr. E. E. Simmons (in which however the figure is not forging but resting), and a draped female figure from Mr. Dodge's Decoration of the Administrative building.

In *Macmillan* Mr. H. Clarence Bourne writes an article on "The Unemployed," the assistance of whom, he points out, is not so simple a matter as Mr. Keir Hardie and "General" Booth believe. "National, Municipal, or charitable schemes for permanent employment, or for the employment of large numbers of men, must lead to disaster in future as they have done in the past; while even small and carefully conducted relief works are beset with difficulties and dangers." He quotes the remarkable little poem in Tennyson's posthumous volume as to the present undeveloped stage of the human race—"Dawn, not Day," and observes that when we have reached Tennyson's prophesied stage we may be ripe for State Socialism: "but even our present institutions would work well enough then." All which is true, but will not be believed by those whom it most concerns.

In *Longman's Magazine* Dr. Richardson gives a very interesting account of a visit of sanitary exploration to Paris, undertaken at the invitation of Dr. de Pietra Santa, secretary of the "Socié é d'Hygiène Publique." Among other things he heard a paper from this gentleman on the Paris water-supply, in which it was urged that every town should be supplied from an independent and pure source, and no stream receiving sewage should ever be utilised for supply. Dr. Richardson gives an account of a visit to the Paris sewers and other institutions.

Blackwood has a pleasant article giving what is called "A Bird's-eye View of the Riviera," which will be interesting to those about to visit that locality for the first time.

In the *Cornhill* we find an article on the rise of towns, describing some remarkable instances of rapid growth, not the least remarkable being that of some of the suburban towns (as they may be called) of London.

In the *Antiquary* we find a description of the "discovery of an ancient Lake Village in Somersetshire," by Mr. R. Munro, a reprint of a contribution to the *Times* in October, which we are glad to find preserved in this more permanent and accessible form. The Rev. C. Cox contributes an illustrated notice of "Mediæval Embroidery at Hardwick Hall." "Notes on Archæology in Provincial Museums" is continued.

Among two or three "Christmas Numbers" of weekly publications which have been sent to us, we may notice a fine chromo-lithograph issued with *Yule-Tide*, of three half-length figures under the title "Rose Shamrock and Thistle," a group of charming heads, and very well printed.

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—The third ordinary meeting of the forty-ninth session of this Society was held on the 5th inst. at the Royal Institution, Colquitt-street, Liverpool. Several new members, students, and associates were elected, and afterwards Mr. John Slater read a paper on "Bricks and Brickwork."

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the Law Institute, Albion-place, Leeds, on the 5th inst., the opening lecture of the session was delivered to members of the Leeds and Yorkshire Architectural Society by Mr. A. Keen, of London, on "Vaulting." Mr. Bulmer, President, was in the chair.

ENGINEERING SOCIETIES.

THE INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting of this Institution on Tuesday last, Mr. Harrison Hayter (President) in the Chair, it was announced that 17 Associate Members had been transferred to the class of Members, and that 83 candidates had been admitted as Students. The first ballot for the Session 1892-93 resulted in the election of 16 Members, 132 Associate-Members, and 3 Associates.

THE SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers, held at the Town Hall, Westminster, on Monday evening last, Mr. Joseph William Wilson, jun., President, in the chair, a paper was read by Mr. A. G. Drury on "The Shortlands and Nunhead Railway." The paper commenced by stating that the line was promoted by several landowners for the purpose of further developing their estates, they being also joined by the L., C., & D. Ry. Company, who by means of the new branch have obtained an alternative route into the metropolis. The railway, which is a double line, commences by a junction with the Chatham Company's main line at Shortlands, passes through open country for the first half of its length, then runs through the suburbs of Catford and Brockley, and terminates by a junction with the Chatham Company's Greenwich branch at Nunhead Station, having crossed a branch of the S.E. Railway as well as the L.B. & S.C. Railway's main line, on the route. The length is 4¾ miles, and, considering the short distance from London, the amount of house property interfered with was very small. Attention was drawn to the fact that the line, having been laid out to suit the views of the landowners, has not been laid out perhaps in the best way from an engineering point of view, also that as some of the estates passed through are about to be developed as first-class building properties, the accommodation bridges are both frequent and of a width or span suitable to the present and future requirements. The elevations, too, are of a more or less ornamental character, all of which requirements have added considerably to the cost of the undertaking. In alluding to the earthworks, a slip which occurred in the Shortlands cutting was described. A portion of the cutting had been trimmed with a slope of 2 to 1, when, after a period of wet weather the material broke away and slid forward on a bed of stiff clay which dipped down towards the cutting. To repair it a deep grip was cut round the back of the slip, and pipes laid to intercept the water and carry it round to the ends of the clay bed, after which a dwarf wall of concrete was built in front to support the toe of the slipped material and to prevent its coming any further. The works were shortly described. The number of bridges in the length being twenty-five, in addition to two short viaducts. Six of these bridges are for public-road crossings, two are over other railways, two are over streams, and fifteen are accommodation bridges. Brickwork and concrete has been used in the construction of the abutments and wing walls, the brickwork being in lias lime mortar except in the case of arches or in damp situations when cement mortar was used. The road bridges over the railway are chiefly of two types. One consists of a floor of plate girders resting on brick abutments and spaced from 6 ft. to 7 ft. apart; between the girders are Jack arches, which spring from their lower flanges, the top is levelled up with concrete and asphalted, the road-metalling being laid above this. This type was adopted as there was not sufficient headway available for arched bridges. When the headway was very restricted another type of floor was adopted, which consisted of shallow troughs of a rectangular section, built with plates and 2-in. bars, and placed parallel with the roadway. In this case the span was divided by columns placed between the lines of rails. At Catford, a short brick viaduct, 620 ft. long, carries the line through the building property; it includes two skew spans with girders and trough-flooring over roads. At the south end of it three arches, spanning the river Ravensbourne and a mill-head, are built on a considerable skew, the angle being 45 degs., with a square span of 32 ft. 6 in. The remaining arches are on the square, and vary in span from 21 ft. to 25 ft. Within 450 ft. of the Catford viaduct there occurs another short one, 200 ft. long, and adjoining this to the northward a retaining wall 500 ft. long has been built on one side of the embankment. This wall is of concrete with counterforts at the back, with the face of brickwork 9 in. thick tied into the concrete by vertical brick dovetails placed 6 ft. apart. The stations on the line are five in number. The works have been carried out under the direction of Mr. John Wolfe-Barry, M. Inst. C.E., the author acting as resident engineer in charge. The contractors were Messrs. Lucas & Aird, who were represented on the ground by Mr. John Blue, and latterly by Mr. Charles F. Day.

COMPETITIONS.

LOCAL BOARD OFFICES, CROMPTON, LANCASHIRE.—The committee of the Crompton (Oldham) Local Board have made the following awards in their recent architectural competition for new board offices:—1st premium, Mr. H. Cheetham, Oldham; 2nd, Messrs. Woodhouse & Willoughby, Manchester and Stockport; 3rd, Mr. John Johnson, Victoria-street, London. The competition was an open one, fifty-two sets of designs being submitted. Mr. John Wild, architect, of Oldham, acted as assessor.

LOCAL BOARD OFFICES, BEXHILL.—We understand that the designs of Mr. H. Ward, architect, of Hastings, have been placed first in this competition by the assessor appointed by the Board to adjudicate on the designs.

SEWERAGE, MYTHOLMROYD.—In reference to this competition mentioned in our last (p. 446, *ante*), we are asked to say that the premiums of 60*l*., 25*l*., and 15*l*., respectively, were awarded as follows:—(1) Mr. F. Beesley, Westminster; (2) Mr. W. H. Thomas, Westminster; (3) Messrs. Savage & Davies, Sheffield.

SANITARY INSPECTORS' ASSOCIATION.

AT the December meeting of this Association, held on Saturday evening last at Carpenters' Hall, London Wall, an address on "An Attempt to Improve the Sanitary Circumstances of London," was delivered by Mr. John Hutton, Chairman of the London County Council, Dr. Richardson, the President of the Association, presiding. Before calling upon Mr. Hutton, the President presented to Mr. C. W. Raymond, the Hon. Treasurer, and one of the original promoters of the Association, a handsome stationery cabinet and inkstand, as a mark of their sense of obligation to him for his devotion to their interests. It was also announced that the Association would offer a prize of ten guineas (to which Mr. Hutton had desired to contribute one-half) for the best model of a sanitary milk-can for retail purposes, in which the defects of material and construction of the cans now in general use should be as far as possible obviated. The competition would be open until March 1.

Mr. Hutton commenced his address by declaring his sense of the importance of the work in which the sanitarian was engaged,—a work which would repay a thousandfold all their efforts,—in the improvement of the physical and moral condition of the people of London. Among the many points of contact which the London County Council must maintain with the people of London, there were none of more importance,—particularly in the poorer districts,—than those which came under the cognisance of the Medical Officer and the Sanitary Inspector. With the appointment of official Medical Officers by the Corporation of London, and one or two others in other parts of the kingdom, some forty years ago, sanitary improvement might be considered to have commenced, but it was not till some years later that the improvement was strongly marked. Between the decade 1861-1871 and the last decade (ending 1891) the average death-rate showed a diminution of 4 per 1,000, and, therefore, during the last ten years the saving had been 150,000 lives, with a corresponding diminution of loss through sickness, as compared with the ten years ending 1871. That enormous saving was the more remarkable, because of the difficulty of preventing the rise in the death-rate which might naturally be looked for on account of the enormous increase in the size and population of London. The Sanitary Act of 1866, and the Housing of the Working Classes Act of 1885, had contributed to this result by extending the scope of the sanitary officer's duties, but the greatest advances in that direction had been made by the most recent of the sanitary Acts, the Public Health (London) Act of 1891. The advantages of admission to the Isolation Hospitals of the Metropolitan Asylums Board had been extended, and under this Act it was definitely required of the Sanitary Authority, not only to secure the abatement of nuisances, but to compel all premises to be put into a proper sanitary condition. A thorough house-to-house inspection by Sanitary Officers was a necessary consequence of this provision, and this implied a right of entry for Sanitary Inspectors. It followed, too, that London must greatly increase its staff of Sanitary Inspectors, who would, after 1895, be compelled to hold a satisfactory certificate of competency, or prove that they had held office for at least three years in a London district, or in an outside district having a population of not less than 20,000 persons. It was further provided that half the salary of the Inspector should be payable by the County Council, and, the Officer's material position being in that way more assured, men of higher qualifications would be attracted to the office, and thus in a few years London would have a greatly-increased number of skilled Inspectors. The practical power of the Inspector had been extended by the clearer definition given to the word "nuisance," and the Inspector's duties in relation to them, and their facilities for enforcing sanitary conditions, were greatly increased by the new power given to Sanitary Authorities of making by-laws. In the opinion of the Chairman of the London County Council, the water-supply of London was far from satisfactory, but it was receiving a large share of attention from the London County Council, and he hoped before long to find that every Londoner would be supplied by a constant and direct service, which would do away with the danger, which at present existed, of the contamination of drinking water by means of water-butts and cisterns. The removal of refuse from a town with a population of 4,231,431 (the number sleeping in London when the last census was taken) was an expensive and difficult matter, and the difficulty was constantly augmenting. The population of London at the beginning of the century was less than a million, and in 1851 it was but little more than half its present amount, namely, 2,362,000. Eventually the by-laws would secure a daily collection of dust and refuse; and moveable receptacles, to be deposited conveniently in front of the house at a certain hour, would take the place of the old brick and wooden dust-bins, which so often created nuisances. Among the matters which would in future come under the control of the Sanitary Inspector instead of that of the police, was smoke abatement, and the speaker directed the particular attention of the Inspectors to the smoke nuisance. In conclusion, Mr. Hutton called upon the Inspectors to do their duties in an earnest spirit. Let them not, he said, allow the fear or favour of any man to tone down their reports. The lives of scores of people might depend upon their integrity. The only stock-in-trade of many an honest worker in this City was his physical strength. Let them think what the loss of that meant to such a man. It was in their keeping, and also in their keeping, humanely speaking, was the child-life of this modern Babylon.

A discussion followed on the customary resolution of thanks, which was proposed by Mr. H. Alexander, the Chairman of the Council. The motion was seconded by Mr. Tidman, C.E., who expressed some disappointment at not finding, what he should be very glad to see put forward with the authority of the London County Council, a code prescribing proper sanitary appliances for houses generally. Thanks were due to Mr. Hutton for his generous offer to give half the amount of the ten guineas prize proposed to be given for the invention of a milk-can suitable for the retail trade. Mr. Pickersgill, M.P., Mr. Alderman Beachcroft, L.C.C., and Dr. Waldo supported the motion. Mr. Beachcroft thought that the services of the Sanitary Inspector could not easily be dispensed with, and that his office would be more permanent in the future, even where an Officer was not permanently elected. The proposed model by-laws had been forwarded long ago to the Local Government Board, which had kept them six months. There was an important provision in the Public Health Act to which Mr. Hutton had not referred, namely, that the opening of any ventilation-pipe for drains must be at least 10 ft. above the highest window of any building.

The President (Dr. Richardson) wound up the discussion, and, in putting the vote of thanks, pointed to the rapid strides made in sanitary science during the last few years, and to the wider interest taken in the subject by the public and the press as proofs of real progress. He hoped Mr.

Hutton would live to see his suggestions carried out efficiently, and to feel that his life had been spent in a great and noble work. Mr. Hutton briefly replied, and the meeting then closed.

Correspondence.

To the Editor of THE BUILDER.

THE MANSION HOUSE.

SIR,—The fourth volume of Colin Campbell's "Vitruvius Britannicus" issued by the architects Woolfe & Gandon in 1767, contains illustrations (plates 41—43) of the London Mansion House, differing in several important points from the building as we now know it. In the first place the well-known Egyptian Hall exhibits the long since removed upper story with windows between Composite three-quarter columns (the "clearstory," as we may call it, to borrow a term from ecclesiastical architecture), and a flat ceiling, which, from its agreement with the description given by Vitruvius of what he terms an "Aula Ægyptiaca,"* originated the once appropriate, but now misleading, name by which the Lord Mayor's banqueting-room is familiarly called. We see also a heavy balustraded gallery running round the hall, and carried across the great end windows. The Ionic Venetian windows below these, now only appearing on the exterior, were then open.

A still more important alteration from the original design is the conversion of the central open courtyard, reaching from the bottom to the top of the edifice into the present "saloon" familiar to the *habitués* of the Mansion House as the place where the Lord Mayor and Lady Mayoress receive their guests previous to the entertainments. This open court cut off the direct communication between the State entrance under the portico and the Egyptian Hall, which could only be reached through the "Long Parlour," the Lord Mayor's semi-state dining-room, to the right, or through the drawing-room and state staircase (now done away with) to the left. The inner windows of these apartments now closed were then open to the courtyard, and were protected by a balustrade. The entrance corridor at the north end of the Egyptian Hall was entirely unshielded from the weather, and there are well-grounded traditions of the guests having their dresses sprinkled with flakes of snow on passing between the long parlour and the drawing-room. None of the many alterations in the interior of the Mansion House has tended more to the comfort and convenience of the building, and its adaptation for State occasions, than the transformation of the open *cortile* into a handsome covered saloon of reception.

Another change has been made in the removal of the State staircase, which led from the *piano nobile* to the bedroom floor, and the conversion of the space thus gained into a second drawing-room on the lower floor, and a State bedroom on the upper. The loss of the staircase is to be regretted, for the two existing staircases, east and west of the entrance corridor, are steep and not over wide, and are hardly worthy of the general stateliness of the building. But the addition of the second drawing-room is a real gain. Even now the two drawing-rooms are insufficient for the accommodation and comfortable circulation of a large party. The upstairs bedroom thus formed in the early part of the century contained the "State Bed," a wonderful specimen of the magnificent but heavy upholstery and drapery of the last century, but which in process of time had become such an unassailable lair for "murderers of sleep" of various species, that, after having baffled the attempts of successive Lord Mayors to rid it of its undesirable tenants, it was committed to the flames, and a more modest and more wholesome bedstead substituted for it. A comparison between this bedroom and the room adjoining, formerly a a bedroom, but now the Lady Mayoress's boudoir, shows the difference of date, and proves that it formed no part of the original design. The walls are simply papered, and there is an entire absence of the rich door-cases and mural decoration which prevail through every part of the house. The change was evidently carried out in a very economical manner, and all needless expense was spared.

The last particular in which the original building differed from the present is in the upper story, or clearstory, of the ball-room. This, which corresponded both externally and internally with the upper story of the Egyptian Hall, was removed not so many years ago, and an arched ceiling at a lower level substituted for it. The "ball-room" had long since ceased to be used for the purpose its name indicates. Balls are now given in the Egyptian Hall, and the old ball-room has become the supper-room.

It would be interesting to know the dates of these successive alterations, and the names of the architects under whom they were carried out. The records of the Mansion-House-Committee of the Corporation must certainly contain them. Might not a history of the Mansion House, with a notice of the chief events which have taken place there, such as public meetings, royal or distinguished receptions, and the like, form a companion volume to that issued by the Corporation on the Guildhall? E. V.

* "Vitruv. de Architecturâ," lib. vi., cap. 5, sec. 31. The same volume of the "Vitruvius Britannicus" contains illustrations of the Assembly-room at York, erected from Lord Burlington's designs, which still exhibit Vitruvius's idea of an Egyptian hall,—Corinthian below, Composite above,—unaltered. See also "Gentleman's Magazine," 1838, vol. ix., p. 605.

"THE INSTITUTE AND ARCHITECTURE."

SIR,—Mr. Fawcett's letter exactly expresses my own feeling at finding my name associated with a bitter attack on the Institute. Were registration in question it would be a different matter, but I hope and believe it is not.

A. E. STREET.

CHRIST'S HOSPITAL COMPETITION.

SIR,—Before it is too late, will you allow me, through your valuable Journal, to suggest to the Council of Almoners the desirability of selecting at least ten names for this competition, and divide the premiums as follows:—

No. 1.—The execution of the works.
,, 2.—400*l.* premium.
,, 3.—200*l.* ,,
And to the next six 100*l.* each.

This would meet with more approval in the profession generally, and give employment to many draughtsmen during the winter. I enclose my card.

"KUDOS" (ONE WHO WOULD COMPETE).

TRADES UNIONISM.

SIR,—It might have been supposed that trades unions, their methods and results, had been for many years too evident and notorious to admit of any intelligent person at all interested in the subject remaining ignorant on these matters. It seems, however, from the course of the Commission on Labour, and the queries addressed to witnesses therein, as reported by the public prints, that utter misapprehension, at least, still prevails among those who might be supposed to be, in these respects, unusually well informed.

Architects who during the half century or so in which these combinations have largely influenced the building trades have had to deal with contracts and contractors, know well what their effect has been both on workmen and work. At the risk of wearying you with a twice-told tale, I will ask you to allow me space in your columns to repeat what appeared in them from my pen about a generation ago, illustrating from facts well within my own knowledge the objects and character of trades-union proceedings, little changed since then, I believe, though apparently forgotten by or hidden from the present race of business men.

A very able and intelligent master-mason, known to me from his youth, had taken a contract for the stonework of a rather large building of the hospital class, designed with a continuous cornice, carried on moulded modillions, which formed the principal decorative feature of the building. These modillions or cantilevers had been estimated for at a price for each, and during some time which elapsed ere the site was cleared the mason tested his price by putting one of his best men to work in his own yard on one of these, and timing his work on it. The man was occupied one day and three-quarters on this, and his master found that by the price charged this would pay him fairly well. Later, the masons' work was carried forward on the building site, and the same man, with others, employed on the cornice details; but, timed again by his master, he spent two days and three quarters on the same work. This was pointed out to him, when he replied: "Oh, yes; and I could do just the same now; but if I were to work faster than the man beside me I should be fined a guinea by the club."

Again, a plasterer,—a first-rate master tradesman,—had undertaken by contract the ornamental ceilings of three contiguous shops. Stepping into one of these on a winter afternoon to see how the work proceeded, he stood in a corner to be out of the slop and splash. Here the fast-failing light nearly concealed him, and while he thus stood there came into the shop a man, a stranger to him, who watched the men at work for a minute or two, and then said to them, "I'll tell you what, my lads; if you can't make this job hold out rather better, I shall have to report you." Then the master presented himself with the question, "Who are you?" on which the stranger turned, and, as described to me, "ran off like a hare." The "Inspector," if you please, of the Plasterers' Union, on his rounds to see that all the work in that trade was duly delayed and dawdled over at the peril of a fine.

In another case a master mason with a large business had an excellent out-door foreman, a Scotchman, as are many good workmen in that trade,—a man who would insist on sound work and a proper amount of it per day. At a time when this master had a number of contracts on hand, a deputation from the men engaged on one of them told him on pay-day that unless this foreman, who "interfered so much with the work," were at once dismissed, all the men in his employ had agreed to strike. His engagements were such that he could not afford to face this, and so, vastly against his will, he had to part with his faithful helper, who at once emigrated to North America (Canada, I think), where he believed trade tyranny would not prevent a man's working honestly. Another firm of builders, taking general contracts, but chiefly known as pre-eminently excellent carpenters and joiners, had managed to keep their large workshops in these trades free from trades-union mischief, but at length received a series of most insolent letters demanding, in high-sounding phrases, with much laxity of grammar and spelling, that information as to their dealings with their men and management of their business should be furnished to the writer, the secretary of the joiners' union. The name appended seemed in some sort known to the recipients, and, looking through their old wages-lists, they recognised it as that of a man turned out of their shops for stealing tools some two or three years before.

These are fair examples of the practice and aims of trade unions, involving the "principles" (!) that the worst workmen shall be paid as the best, that the best shall lower their standard of work to that of the worst, that no man shall venture to claim a preference as a superior hand, or do more work than the "club" permits, that any impudent vagabond who can write a blatant note is fit to represent their interests and bully the masters, and that the latter and the public who employ them are proper subjects for every form of fraud and conspiracy.

All confidence between masters and workmen is thus undermined, good work in all trades is put at a discount, and the enslavement, degradation, and demoralisation of workmen promoted and secured.

SENEX.

COAL OR GAS FIRES?

SIR,—Your query, in last week's issue, to your correspondent's suggestion that we should all use anthracite coal, is a very natural one. Your correspondent says nothing about the difficulty of burning anthracite in an open grate, nor about its cost or abundance in this country. He says, "Considering that anthracite is burnt so largely in America, it is a source of wonder to me that this unique coal, which is found in our own country, should have been so long neglected."

If your correspondent would compare the coal supplies of this country and America, he would, I think, cease to wonder.* In America anthracite is, comparatively speaking, very abundant, while bituminous coal is scarce. In England, bituminous coal occurs in larger quantities than anthracite. Hence coal-gas is dearer in America than in England, and consequently electricity, as a source of light and motive power, flourishes more in the former than in the latter country.

Upon the question under discussion,—viz., which are the better, coal or gas fires?—I would add that, having had experience with both, I have come to the conclusion, as a scientist, that a gas-fire in London, or other towns, where gas is as cheap and coal as expensive, is decidedly more economical than an ordinary coal-fire, if not required for many hours at a stretch. But, as a frail mortal, I must confess to having a great partiality for a roaring, wasteful, open coal-fire. Moreover, the endeavour to utilise the whole of the heat produced by the combustion of coal-gas has now reached such a degree of perfection, that in many stoves there is not sufficient waste-heat to produce a strong updraught in the chimney. Consequently, when the wind is at all gusty, the unwholesome combustion products are blown at frequent intervals into the room, and, being invisible, are not noticed until they have worked their effect upon the system. With a bright coal-fire, the large amount of waste-heat produces a strong updraught, and not only are all the combustion products carried up the chimney, but at the same time we have an excellent ventilator.

H. F. H.

ANTHRACITE COAL.

SIR,—On page 444 of your issue of 3rd inst., your correspondent "R. S. R." suggests the use of "anthracite coal," which, he says, is without

* On this subject the reader may be referred to some remarks in the second article in this number.—ED.

smoke, smell, or dirt. As I have upon several occasions endeavoured to use this coal in my portable, fixed, and traction engines respectively, I should like to say that, from my experience, I do not think this coal could be used for domestic purposes in an ordinary open fire-grate. It is a very hard coal indeed, practically non-gaseous, and without flame, and consequently will not burn unless with a strong draught. Then the heat is merely local, and has a tendency to burn one's fire-bars and bottoms out of the grates, all of which I think would be too troublesome for it to come into use for domestic purposes. The only manner in which it could be used, I think, is (and it is to this use the coal is put in America, so far as I understand) to burn it in the ordinary furnaces for heating water, which hot-water system would be carried all over the house, as in America, and heat obtained thereby, but this at once does away with the open, cheerful fires.

F. J. BARNES.

THE SIX CLERKS' INN, CHANCERY-LANE.

SIR,—In a letter you printed on November 26, Mr. Blott seems to question John Kedermister's gift of Herfleete's Inn to the Six Clerks. Sir George Buc's account forms chapter xxvi. of his "Third Universitie of England: or a treatise of the Foundations of all the Colledges, Ancient Schooles of Priviledge, and of Houses of Learning, and liberall Arts, within and about the most famous Citie of London . . . .." dedicated to Sir Edward Coke. Buc describes Kedermister as "one of this Society [the Six Clerks], and a most skilfull man in his profession, and as faithfull a man to his friends and clients as ever was in his place, as I can testifie by good proofe." His treatise will be found at the end of Edmund Howes's "Annales," a continuation of Stow's Survey, as printed in black letter, 1631, folio. I believe it is printed also in the 1615 edition of Howes's book. Having succeeded Edmund Tylney as Master of the Revels in 1610, Buc died in 1623. In Bray's edition of Manning's "Surrey," III. 425 (1814, fo:) is mentioned a monument in St. Giles's parish church, Camberwell, to Sir Peter Scott, Knt., *ob.* 1622, recording that "Hee married Elizabeth eldest daughter of Edmund Kedarmister, Esq., one of the sixe Clarkes of Chancery." Strype, in Book III. p. 263, of his Survey (1720) says:—

"On the west side [of Chancery-lane] sometime was an house pertaining to the Prior of Necton Park, a House of Canons in Lincolnshire. This was commonly called Hereflete Inn, and was a Brewhouse; but now fair builded for the Six Clerks of the Chancery, and standeth over against the said House, called the Rolls . . . ."

W. E. D-M.

The Student's Column.

CONCRETE.—XXIV.

PAVING AND FLOORS.

IT will be best at the outset to divide the subject into two parts, namely, *paving*, —which is a floor-surface resting on solid ground, and *floors*, which we will take to mean floors over voids.

Paving.—The use of concrete for paving is extending rapidly both in buildings and in streets. Miles upon miles of footpaths in London and elsewhere have been formed with concrete, either deposited *in situ* or laid in the shape of flags. And although we could point to many failures of concrete deposited *in situ*, to great cracks and honey-combed surfaces, yet, on the other hand, we could point to paving which, after years of heavy traffic, seems as perfect as it did a month after it was laid. One objection, which is frequently raised against a concrete footpath deposited *in situ*, is the difficulty of cutting through it whenever it is necessary to connect the drains, or water-pipes, or gas-pipes of buildings adjoining the footpaths with the mains in the streets, and the further difficulty of making the paving good after it has been so cut. This objection has had so much weight that most town-surveyors or engineers prefer to use the concrete in the form of flags, and the manufacture of such flags has within recent years been considerably extended.

The patent Victoria stone is a well-known kind of concrete, and consists of one part of Portland cement and three parts "granite" chippings not much larger than peas; the mixture is cast in metal-lined moulds, and then steeped in a solution of silicate of soda. The blocks are afterwards washed with clean water and allowed to harden before use. Part of the silica of the solution is given up and combines with the free lime of the cement, and apparently hastens the induration of the concrete. The compressive strength of this stone is said to surpass that of the best sandstones; while, in imperviousness, it is said to be better than Bath and Portland stone, about equal to the best sandstones, but considerably inferior to granite, syenite, and good trap and basalt. The "granite" used in the manufacture is really a syenite from the Groby quarries in Leicestershire, which, according to Rivington's *Notes*, weighs 173·4 lbs. per cubic foot.

The Imperial stone, formerly known as Silicated stone, is another well-known concrete. It consists of 1 part Portland cement mixed with 3 parts granite crushed in Blake's crushers until the largest dimension of any piece does not exceed three-eighths of an inch. The process of manufacture is very similar to that of the Victoria stone, in both cases a bath of silicate of soda being used.

Granite-concrete flags of good quality are also made by Messrs. W. B. Wilkinson & Co., by The Croft Granite, Brick, and Concrete Co., and by Stuart's Granolithic Paving Co. The durability of such paving is beyond question. It does not crack or scale away, and has a hard dense structure. Some artificial paving can be obtained with impressed patterns, which have a good appearance and improve the foothold, while other paving is supplied in various colours, and can then be laid in simple patterns. The usual thickness of artificial flagging is from 2 in. to 2½ in., the usual breadth is 2 ft., and the length varies by 6 in. from 1 ft. 6 in. to 3 ft. 6 in. Mr. Lascelles advocates the formation of an air-space under artificial flagging in dwellings by means of small concrete piers, on which the corners of the flags are supported; this air-space prevents the rising of damp through the floor.

But while artificial flags are useful for the footways of streets, there are many situations in which a jointless slab of concrete is much better, such as the floors of basements, or of rooms, on the solid ground, or of stables, cow-houses, &c. In these cases a floor is required which, while having a durable surface, also prevents the rising of moisture and of subsoil gas, and the percolation of foul water and sewage into the ground beneath. Some kind of concrete flooring, which can be deposited *in situ*, and without joints, should then be adopted. If a specially durable kind be required, it may be specified to be laid by one of the firms already mentioned, for all these firms undertake such *in situ* paving. The Patent Victoria Stone Co. prefers a foundation of broken brick about 4 in. thick, upon which is laid in one operation a layer of concrete 2 in. thick, composed of 1 part Portland cement and 3 parts finely-crushed and machine washed granite. This paving is not treated with silicate of soda in any way.

Another kind of *in situ* paving is laid by the Imperial Stone Co., and is known as "Petro-silicon." Where heavy traffic is expected on the paving soon after it is laid, the surface is treated with silicate of soda in order that the hardening may be hastened. No list of paving would be complete if mention were not made of Stuart's Granolithic Paving, which has achieved a world-wide reputation, and is used with equal success in buildings or in the open air.

The following method is recommended by Messrs. W. B. Wilkinson & Co. When the ground, after being excavated to the proper depth, is soft, it must be well rammed, or, in bad cases, a layer of common concrete may be laid, the upper surface of which must be 6 in. or 7 in. below the intended finished floor-line. On consolidated ground, a layer of brick-bats or stone-rubble is spread and then broken, so as to form a layer about 4 in. thick; the breaking helps to consolidate the ground still more. (When a common concrete foundation has been laid, the brick-bats or rubble should be broken before being spread.) There should be no soil or small stuff among the broken material, and this should be laid roughly to the various gradients required. On the broken material, the proper concrete pavement is laid down soft and finished with a smooth or grooved surface as required. For moderately light traffic, as in coach-houses, warehouses, footpaths, gentlemen's stables, &c., the paving is usually laid about 2 in. thick, and a thickness of 3 in. is found enough for the heaviest horses, carts, rolling casks, &c. For stables, stable-yards, conservatories, sloping-ground, and other places where liquid-manure or water would otherwise spread over the whole surface, or where a good foothold is necessary, the surface of the concrete is indented or grooved in various patterns, and channels are formed for drainage where required.

The expansion and contraction due to changes of temperature frequently cause cracks in large areas of paving exposed to the weather. The difficulty can be overcome by forming the paving into separate slabs by means of laths about ⅜ in. thick, placed in the concrete every 8 ft. or 10 ft.

A common method of forming basement-floors, especially in towns where a 6-in. layer of concrete over the whole site of a building is required by the by-laws, is to deposit concrete 5 in. or 6 in. thick, and finish the surface of this in one of the various ways hereafter mentioned. As this concrete is intended to keep down moisture and subsoil air, it should be as impervious as possible, and for this reason a considerable quantity of sand and small gravel should be used in its composition, so that all interstices may be well filled. For instance, the concrete might consist of 1 part Portland cement or good hydraulic lime, 2 parts clean sand, 1 part pea-gravel, and 3 parts gravel, stone, or brick, broken to pass a 1¼-in. ring.

Where brick paving is adopted for stables, &c., it is best to deposit for the reception of the bricks a layer of concrete, laid to the proper gradients. The surface of the concrete can be finished with a ½-in. coat of cement mortar (1 to 1, or 1 to 2), in which the bricks can be bedded; the joints of the bricks should be carefully made with the same mortar and then grouted over with neat cement grout.

Floor Surfaces.—Similar concrete beds, with perfectly level surface-coats of cement mortar, are required to receive floor-tiles, mosaic, wood-blocks, &c. In the case of wood-blocks, when the surface-coat is hard a layer of bituminous composition must be spread upon it to receive the blocks. There are, however, several systems of wood-block flooring in which metal keys are inserted in the concrete for the purpose of securing the blocks, or in which small cubes of wood are inserted to which the blocks can be secured with screws or metal discs. In basements and outbuildings, the surface of concrete floors can be economically finished with a thin coat, ½ in. or ¾ in. thick, composed of Portland cement and clean coarse sand or sharp grit, well trowelled. This ought to be applied before the concrete has set, in order that the whole may set into one mass. Such a facing, however, wears somewhat rapidly, and gives rise to a considerable amount of dust. Granite sand gives better results than ordinary sand. Clean crushed crystalline limestone, quartz, and granite from which all dust and sand have been removed form good aggregates for surface-coats. They should be mixed with neat Portland cement in the proportion of 1 part cement to 2 parts aggregate, and should be laid to a thickness of 1 in. or 1½ in., well beaten, and trowelled to a smooth surface. Sometimes coloured glass and marble are used as part of the aggregate, and frequently colouring matter is mixed with the cement. Mr. Hamon Lockwood, of Manchester, has finished many concrete floors in this way, white spar, coloured glass, and marble being imbedded in a red or blue matrix, and the whole being afterwards well polished. These floors are ornamental and extremely durable.

When a polished floor is required, cubes (varying, say, from the size of peas to the size of small filberts) should be used. Cubes of granite, &c., screened through two sieves (the one to eliminate the fine particles, the other the large pieces), and with the irregular-shaped pieces picked out by hand, can be obtained for the purpose. Care must be taken that the fine dust, found during crushing, is washed from the aggregate.

Building-owners frequently exhibit a partiality for ordinary boarded floors, even when fire-resisting construction is adopted. Sometimes ordinary boards are laid upon the concrete layers in basements without any intervening joists or bituminous composition. Such floors should have a first layer of good dry broken stone or brick, then a layer of ordinary concrete 3 in. or 4 in. thick, and finally a 2 in. layer of coke-breeze concrete (1 to 4), brought to a perfectly-level surface. When this has dried sufficiently, which will not be in less than three or four weeks, the floor-boards can be laid and nailed directly to the coke-breeze concrete. Mr. C. F. Moxon, in the *Builder* for Sept. 8, 1888, declares that there is no danger of dry-rot; we think, however, that a thin coat of bituminous composition, spread over the concrete as for wood-blocks, would be an additional

safeguard. For upper floors, of course, there is no reason why the boards should not be nailed directly to the concrete, if coke-breeze concrete be used.

Where the floors are not composed of coke-breeze concrete, some other method must be adopted. Sometimes strips of coke-breeze concrete are laid upon the other concrete, and to these the boards are nailed, or small dove-tailed wood-blocks are inserted in the concrete, to which small wood fillets (2 in. by 1½ in., or thereabouts) are nailed, and to these the boards are

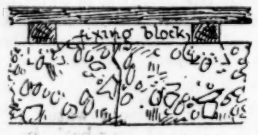


Fig. 10.

secured, as in fig. 10. Substitutes for the wood-blocks can be found in Wright's concrete fixing blocks, or in Jabez Thompson's brickwood fixing blocks. Sometimes the fillets themselves are cut to a dove-tailed section, and imbedded

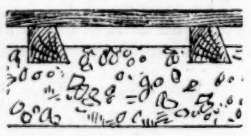


Fig. 11.

in the concrete, as in fig. 11. Objection is frequently taken to the cavities left in the floors by the various systems of boarding on wood fillets. Certainly they harbour dirt and vermin, and are, therefore, sanitarily imperfect, but they have the advantage of deadening the sound to some extent, and in solid concrete floors the transmission of sound is a great disadvantage. When necessary, the cavities can be filled with coarse concrete, slag-wool, &c.

GENERAL BUILDING NEWS.

Junior Constitutional Club.—This new club-house in Piccadilly, which was opened for the use of members on Monday last, occupies the site of four houses between the Badminton Club on the east, and Sir Julian Goldsmid's house on the west, with a superficial area of about 11,000 ft. The basement contains kitchen, 58 ft. by 24 ft., with larders and other offices surrounding it. On this floor also are the wine cellars and servants' hall, and rooms for men-servants, as well as a considerable space devoted to steam-boilers, pumps, &c. On the mezzanine floor over, which is on the level of Yarmouth-mews, are arranged stewards' offices, and rooms for the upper servants, still-room, and members' lavatories, &c. The ground-floor is raised about 7 ft. above the level of Piccadilly, and contains in the front a smoking and morning-room 85 ft. long by 28 ft. wide, and 22 ft. high, divided by white marble columns with deeply recessed bays. At the back is a billiard-room with three tables. The entrance - hall is placed at the east end facing Piccadilly, with an entrance-door of Ross of Mull granite, flanked with large Shap granite columns. From this, by a flight of marble steps, a spacious vestibule is entered, off which is a reception-room for the use of the friends of members. The vestibule opens into an inner hall, 44 ft. by 30 ft., divided by large red marble columns which mask the marble staircase leading to the first floor. This staircase is 10 ft. wide, and is entirely of white marble with Waulsort marble balusters, while the walls of the whole of this, as well as the inner and outer halls and the wide vestibules on the principal floors, are lined with Waulsort and clouded vein marble. The space for service on each floor is arranged centrally, with service, wine, and luggage lifts to every floor from the basement and service staircase. A hydraulic elevator for members goes to each floor. The great height of the main floors has enabled the architect to arrange various rooms for servants, &c., in dividing mezzanine floors over the back portions of the building. On the first floor the grand staircase leads to a large central landing 24 ft. by 20 ft., off which on the left is the Morning Room, 72 ft. long by 25 ft. wide, divided into unequal portions by columns, with the back part raised some 2 ft. or 3 ft., which breaks the length of the rooms. The grand dining-room is L shaped, the front portion with deeply recessed bays, being 85 ft. by 28 ft., and 20 ft. high, and divided by marble columns, with elaborately-designed fire-places and mantels at either end. The returned portion of this room is 60 ft. by 25 ft., giving a total length of 145 ft., and is so arranged that it can at any time be used for meetings. On the second floor is a library 62 ft. by 25 ft., fitted up all round with designed book-cases and high mantelpieces, and in addition are drawing, house committee, and dining, card and private billiard-rooms, and rooms for the secretary and staff. On the three upper floors have been arranged between sixty and seventy bedrooms, for the use of members, and rooms for servants. The whole of the building throughout, including the roof, is of fire-proof construction, carried out from the architect's designs by Messrs. Homan & Rodgers. The exterior has an imposing façade facing Piccadilly, with three boldly-designed bays with gables over, the whole front being faced with white Norwegian marble, with Portland stone freely used in the general dressings and cornices throughout. Ross of Mull and Shap granite being used in the large columns on the ground floor, and for the smaller shafts of the more important windows. The general design of the façade is Italian Renaissance, freely treated. The whole of the building throughout, including the internal decorations and fittings, have been designed by Colonel Robert W. Edis, F.S.A. The general contractors' work has been done by Messrs. Bywaters & Sons, the marble work throughout as well as the furnishing by Messrs. Maple & Co., the internal sanitary and engineering work by Messrs. Matthew Hall & Co., the ornamental plastering work by Messrs. Jackson & Sons, the kitchen fittings by Messrs. Wilson & Son, the elevator and lifts by the American Elevator Company, the whole of the marble and stone front having been executed under the general contractors by Messrs. Burke & Co. The new building is entirely lighted with electric lighting by Messrs. Edmundson & Co., and the principal rooms are fitted with elaborate electroliers, carried out from the architect's designs by Messrs. Starkie, Gardner, & Co., and Messrs. Rashleigh, Phipps, & Dawson.

School, Darlaston.—We are informed that plans for new infant school, All Saints, have just been approved by the Education Department. Mr. Henry E. Farmer, of Darlaston, is the architect.

New Workhouse at Patricroft.—On November 30, being the forty-third anniversary of the formation of the Barton Union, the Barton Board of Guardians laid the foundation-stones of the proposed new workhouse at Patricroft. This, when completed, will afford accommodation for at least 500 inmates, and the cost of the new buildings will be over 30,000*l*. The site, inclusive of the present premises, will cover an area of over six acres. The stone on the north-east side of the principal entrance of the administrative block was laid by Mr. S. J. Reade, Flixton (Chairman of the Board), and that on the south-west side by Mr. Noah Robinson, Swinton (Chairman of the Workhouse Extension Committee). The Guardians have found it advisable to build the workhouse in sections, and the first comprises the wards for the aged, infirm, and able-bodied, and the administrative block. The tender for the erection of the first section has been let to Messrs. Southern & Sons, Salford, for 16,250*l*., and is to be completed by April 1 next. The proposed buildings will be plain but substantial. Messrs. Mangnall & Littlewoods are the architects. In his address Mr. Reade (the Chairman) stated that the Guardians purchased the mill of Messrs. Moore & Waddington,—the site of the new workhouse premises,—for the sum of 3,500*l*., and the sale of materials and machinery realised 1,476*l*. Several blocks of cottages have been purchased for 7,145*l*.

Board School, Leith.—The new public school in Great Junction-street, Leith, was opened on the 17th ult. by Mr. Munro Ferguson, M.P. At the beginning of last year the School Board acquired Dr. Bell's school in Great Junction-street from the trustees, and plans were prepared by Mr. George Craig, architect, Leith, to add a large wing behind the old building, of which as much as possible was desired to be retained, but to be so altered as to meet the requirements of modern school life. The larger portion of the old school, which is one story high, has accordingly been preserved and divided by glass screens into three class-rooms for the accommodation of infants, while the added wing is three stories in height, and contains ten class-rooms, six of the rooms being separated by moveable glass screens. The original Gothic façade, skirting the street, with the statue of Dr. Bell in a niche, has not been altered in appearance, and the architecture of the new masonry has, it is stated, been made to harmonise with it. A staircase ascends from the centre of the new wing to the other floors, and the halls and landings are built of iron and concrete. On the upper floor are the sewing, music, and cookery-rooms, while other rooms have been set apart for a library and museum. The walls of the halls, corridors, lavatories, and cloak-rooms have a dado of tinted glazed tiles, and the class-rooms a dado of varnished pitch-pine. The school will give accommodation for 1,082 pupils, and the cost is expected to be about 8,000*l*. Messrs. Kinnear, Moodie, & Co. were the builders. On the vacant ground on the west side of the school a swimming-bath for the use of the scholars is to be constructed at a cost of 2,000*l*.

St. Barnabas' Church, Middlesbrough.—On the 19th ult. the Archbishop of York consecrated the Church of St. Barnabas at Linthorpe, Middlesbrough. The church is in an unfinished state, the chancel, organ-chamber, and south aisle having yet to be built; but the nave, two aisles of six bays, and the south porch have been completed. The cost of the church so far amounts to about 3,000*l*. The church is built of brick, with stone dressings. The seats, which are open, are of dark stained wood, and seating accommodation is intended in the whole church for 750 persons, the portion already built accommodating about 500. The architect is Mr. C. Hodgson Fowler, of Durham; and Mr. W. Bastiman, Linthorpe, Middlesbrough, is the contractor.

Higher Grade School, Wolverhampton.—According to the *Wolverhampton Chronicle*, the foundation stone of the Higher Grade School which is being erected in the New Hampton-road, Wolverhampton, was laid on the 21st ult. The buildings consist of a main block two stories high, with a side wing also two stories in height, besides workshops and covered playgrounds behind the main building. The main block is arranged on the central hall system. The principal entrance is from the New Hampton-road, and this also forms the entrance for boys, provision for whom is made on the ground floor. The central hall is 67 ft. by 34 ft. by 42 ft. high, and is open to the roof. For the elementary education for boys six class-rooms are provided, 25 ft. by 24 ft. 8 in., also one class-room 29 ft. by 24 ft. 8 in. There is a headmaster's room, pupil teachers' room, and accommodation for hats and lavatories. The girls are provided for on the first-floor, with a principal entrance from the side street. Four class-rooms are provided. These all communicate with a gallery carried all round the central hall. Rooms for the head-mistress and for pupil teachers, with lavatory accommodation, are provided for this department. On this floor is a cookery-room, 32 ft. by 24 ft. 8 in., with scullery and store-rooms, also an art-room, 25 ft. by 24 ft. 8 in. There will be five small music-rooms and store-rooms for books and utensils. The side wing will be occupied on the ground floor by a chemical lecture-room, 29 ft. by 28 ft., with an additional room for preparing for experiments, &c., and on the first floor will be the chemical laboratory, 38 ft. by 29 ft., and physical room, 31 ft. by 18 ft. 6 in. The buildings will be executed in red brick, relieved by terra-cotta. The roofs will be covered with green slates, and the whole of the interior joinery will be of red deal, painted. The contract for the building has been let to Mr. H. Lovatt, contractor, of Wolverhampton, and the work is being carried out under the superintendence of Mr. T. H. Fleeming, architect, Wolverhampton.

FOREIGN AND COLONIAL.

France.—We regret to have to announce the death of Pierre Victor Galland, the well-known decorative painter. He died suddenly two days ago at the age of seventy. He was Professor of Decorative Art at the Ecole des Beaux-Arts, director of the works of art at the Gobelins manufactory, and Member of the Superior Council of Fine Arts. We shall speak more fully of him in our next Letter from Paris.——The death is also announced, at Lyons, of Gaspard Poncet, who executed the cartoons for the mosaics in the cathedral at Fourvières.——After three tours of inspection, the Académie des Beaux-Arts has just elected the painter, Olivier Merson, in place of the late M. Signol, by 24 votes, against 13 given to M. Carolus Durand, and one attributed to M. Benjamin Constant. The new Academician was born in Paris in 1846. He was a pupil of Pils, and of Chassevent, and obtained the Prix de Rome in 1869. He received a first medal in 1878, the Legion of Honour in 1881, and a gold medal at the Exhibition of 1889. His father is much thought of as an art critic.—The funeral monument of the sculptor Charles Gauthier has just been inaugurated in the Montparnasse Cemetery. The monument is decorated with a bust by M. Blanchard.——The monument of Théodore de Banville, which has just been inaugurated in the Luxembourg Garden, is the joint work of M. Courtois and M. Roulleau, the former designing the pedestal, the latter the sculpture. The bust of the poet rests on a marble pedestal, which is in the form of an antique altar, with a lyre and palm, encircled with roses. The whole thing is very charming and original.——The National Society of Architects has just given judgment on its annual competition. The subject given was "A Lodging-house in the XVIIth. Arrondissement" (Batignolles). The first prize was awarded to MM. Victor Collas and Henri Dandaune, the second prize to M. Germain Madaule, and the third to M. Paul Martin.——MM. Besnard, Aubler, Machard, and Renouf, painters, and M. Louis Noël, sculptor, have just received medals of the first class from the judges of the Exhibition of Fine Arts at Madrid.——The General Council of the Seine has just acquired a statue by M. Hercule exhibited in 1887, representing a sailor defending the flag. This statue will be erected at Choisy-le-Roi, in commemoration of the victory by the sailors against the German Army in 1870 at la Gare-aux-Bœufs.——An exhibition of the "néo-impressionniste" painters is to take place shortly at 32, Boulevard Poissonière.——A certain number of Russian painters are proposing to have an exhibition of their works during

the coming year.——There is a talk of erecting a monument at Carbonne (Haute Garonne) to the memory of Charles de Rémusat, French politician, who, after the war of 1870, was sent to Berlin to discuss the question of the occupation of territory.——The committee formed for erecting a monument to the memory of the celebrated sculptor, Barye, has just definitely settled the project for the monument, which will comprise a large stele ornamented with a medallion of the artist, and reproductions of his principal works; on the right and left will be the groups of Peace and War, in front will be his well-known lion, and on the summit the group of Theseus.——A fine-art exhibition will be held at Moulins (Allier) during the course of next year.——The death of M. Bouluguet, architect, is announced at Bordeaux. He was a member of the Société Centrale.

BERLIN.—A part of the old "Dom," which is being demolished to make room for the new cathedral, is being cut up into paper-weights, which are to be sold with the Emperor's consent for the benefit of a charity. Patriotic citizens will thus be able to buy souvenirs of an unhistorical building which for many years could boast of being Berlin's greatest eyesore.——A fine bust of the late Professor Martin Gropius, better known as the head of the Berlin firm of architects, Messrs. Gropius & Schmieden, has been presented to the "Architekten Verein," and has been placed in position with much ceremony. Professor Gropius gave much attention to the design of the Arts and Crafts Museum at Berlin, and to the unique Concert Hall at Leipsic.——Besides the enormous sums to be spent on public works by the several German States, the Imperial Government, as such, will during the coming year have an outlay of about 5,300,000*l.* Barracks, store-houses, factories, &c., for the army will alone cost some 2,100,000*l.*; works for the Imperial railways some 400,000*l.*, and the North Sea-Baltic Canal will require 1,600,000*l.* The Budget, of course, only covers the work actually to be done in the course of the year, which in most cases is but a small part of the extensive schemes in hand. Next to the North Sea-Baltic Canal scheme, one for new store-houses for the Army Commissariat Department perhaps ranks first.——Dr. Werner von Siemens, the eminent electrician and inventor of the pneumatic tube system, died on Tuesday at the age of seventy-six. He was a most popular figure in Berlin architectural circles, to whom he was also known as honorary member to the Prussian Academy of Works, and as technical juryman on many architectural competitions of importance. In Dr. von Siemens artists lose an influential friend and patron. We gave some account of his life and work not long since (*Builder*, October 22, 1892).

MISCELLANEOUS.

THE PAINTING AT WENHASTON CHURCH.—By the permission of the Society of Antiquaries, the large ancient painting, 17 ft. by 8½ ft., on oak, of "The Judgment," recently discovered in Wenhaston Church, will be on view at the rooms of the Society, Burlington House, for a week from Thursday, December 15, in the evening of which day a paper on the subject will be read by Mr. C. E. Keyser, F.S.A. The Rector and Churchwardens of St. Anne's, Soho, have kindly consented to allow the Vicar of Wenhaston to exhibit the painting, which has excited great interest in the Eastern Counties, at their school-room, Dean-street, Soho (close by Piccadilly-circus, Shaftesbury-avenue, and Oxford-street), from 10 a.m. to 4 p.m., and from 8 p.m. to 10 p.m., on the 23rd, 24th, 26th, and 27th of December. A small charge for admission will be made at the Soho Schools on behalf of the restoration of Wenhaston Church.

THE LAW AS TO BUILDING SOCIETIES.—At the weekly meeting of the Balloon Society, held at the St. James's Hall, on Friday evening, December 2, Mr. Thomas Richards, solicitor, delivered an address on "The Uses, Abuses, and Reform of Building Societies." The chair was taken by Mr. Montagu Holmes, F.S.I., who made a few opening remarks. Mr. Richards called attention to the Building Societies Act of 1836, which first gave Building Societies a legal status, and then to the privileges conferred on building societies by the Act of 1874. He stated that, as solicitor to several building societies, and as an ex-secretary to a society, he had had opportunities of forming an opinion on needed reforms, which he suggested should be included in a new Act of Parliament. They were:—1. That the amount to be lent on any one property should be restricted to 1,000*l.* 2. That the amount to be lent to any one borrower should also be restricted. 3. That each society should publish annually the number of mortgages representing its assets. 4. That each society should show as a separate item in its balance-sheet the number of properties on hand and the amount of principal due thereon. 5. That it should be illegal for any society to lend on second, or subsequent charge (except by way of collateral security). 6. That it should be illegal for any society to lend to a limited liability company. 7. That the reserve fund (if any) should be invested in trustees' securities (other than on mortgage), so as to be readily convertible. 8. To provide for a more efficient audit, and supply a separate form of balance-sheet to be used by permanent and terminating societies. 9. That a certain portion of deposits should be lent on ordinary mortgages at three months' call, so that the society can (if necessary) call in its principal to repay depositors, or transfer its mortgage to a private mortgagee. 10. That District Government Inspectors be appointed to periodically call on building societies to see that they conform to law (just as banks send inspectors to their branches). Mr. Richards stated that if some of these provisions had been included in the Act of 1874 it would have been impossible for the Liberator Society to have been in the position it was in to-day. He thought that the restriction of advances on any one property was the most important of all. Building societies were intended to aid the working classes to become their own landlords, and not to encourage speculation in large properties. It was bad to have too many eggs in one basket, and where societies lent sums averaging 400*l.* or 500*l.* to persons purchasing houses for occupation almost on the "one-man-one-house-principle," they could not go far wrong. Fifty millions sterling was invested in building societies having over 600,000 members, and surely this formed part of the wealth of the nation, and the subject was sufficiently important to call for a Parliamentary inquiry, when witnesses could be examined and views of experts taken, and a new Act of Parliament framed to make building societies more useful in the future than they have been in the past. Building societies had done good work in the past, and would do more good in the future. The following resolution was then passed, on the motion of Mr. Peard, seconded by Mr. C. Burt:—"That, having regard to the large amount of savings of the thrifty invested in building societies, amounting to over fifty millions sterling, it is a matter of urgent public importance that a Parliamentary inquiry should immediately be held as to the causes of the recent failures of building societies, with a view to such early legislation as will (if possible), prevent a recurrence of such disasters, and tend to protect the savings of the thrifty."

CHANCEL-SCREEN, ST. ALBAN'S CHURCH, LEAMINGTON.—A fourteenth century chancel-screen was unveiled at St. Alban's Church, Leamington, on the 20th ult. The screen consists of a series of five cusped main arches, the centre one, forming the entrance to the chancel, being much larger than the two on each side. Over these arches there are canopies with carved crockets and finials and light open tracery, surmounted by an embattled cornice. The centre canopy rises higher than those at the sides, and is surmounted by a cross with carved terminations. The work has been executed in best wainscot oak by Messrs. Cornish & Gaymer, of North Walsham, from the designs of the architect, Mr. W. Bassett-Smith, Adelphi, London.

IMPROVEMENT SCHEMES FOR ABERDEEN.—A draft of the Parliamentary Bill which the Town Council of Aberdeen are to promote in the ensuing session for powers to execute certain public works is in course of completion. The Bill provides for the extension of the gas and water works, the erection of new police buildings, and seeks to give the Town Council complete proprietary rights to the Old Town Links. A sum of 100,000*l.* is set down for the gasworks extension, but twenty years may elapse before the whole of this sum is expended. As to the waterworks, it is proposed to ask powers to the Town Council to create special drainage districts, and to acquire land for treatment by irrigation with the sewage of the principal villages on Deeside west of Invercannie. Powers will also be sought to enable the Town Council to compel the authorities of these villages to have the sewage conveyed to a main sewer which will be laid by the Council, in order that it may all be carried to the irrigation lands instead of being allowed to run into the river. There is also the provision of a new settling-pond, &c., and the scheme is estimated to cost close upon 100,000*l.* The Bill deals further with the erection of new police buildings, including barracks for the accommodation of a portion of the force, and these buildings will cost about 10,000*l.* Altogether, the projected schemes will, it is estimated, involve a total outlay of no less than 230,000*l.*—*Scotsman.*

THE ENGLISH IRON TRADE.—There has been little alteration in the English pig-iron market, although the favourable nature of the Cleveland Ironmasters' Return imparted a firmer tone to several districts during the earlier part of the week. Prices have, however, since weakened, and business generally throughout the crude-iron department is quiet. In finished iron few transactions are recorded, and quotations are less firm. Tinplates are also quieter. In steel but slight changes have taken place. Shipbuilding and engineering manifest few alterations. The coal trade is slightly brisker.—*Iron.*

PUBLIC SHOWER-BATHS.—In the Berlin Health Exhibition of 1883 Dr. Lassar exhibited a shower-bath designed for use by the public. The conditions laid down to be observed in the case of public bathing establishments of this character are:—Separate baths for each person to be provided at such a cheap rate as to be accessible even to the poorest classes; to be a cleansing bath, and permit the abundant use of soap; and, lastly, the bath must be rapidly prepared and capable of being quickly used, as the time at the disposal of the bathers is generally very limited. The system devised by Dr. Lassar has been adopted extensively in Germany, at Berlin, Magdeburg, Frankfort, and many other towns, with marked success. New baths of this kind have been designed for Brunswick. The site is covered by a one-story building, occupying an area of 46 square feet. Half the space has cellars beneath. Fewer women than men are found to use the baths; so there are fifteen shower and two slipper baths for men, and six shower and one slipper bath for the women. Some of the women's compartments contain seated douche-baths. The heating apparatus for the water is a vertical boiler with 16 mètres of heating-surface. It is placed in a cellar, and the water circulates from it to the roof. A hot-air apparatus warms the building and heats the drying-stove for linen. The compartment for each bather is 8·2 ft. by 4·9 ft. The hot-water douche flows through a 50-millimètre pipe, the top being of special construction, so as to limit the supply and prevent waste. The supply of cold water is not limited. The charge for each shower-bath, including use of soap and towel, is 1d.; and for a slipper-bath the charge is 2d. The total cost is 1,350*l.*, or 56*l.* 5*s.* per bath cell.

BRICK STREET PAVING.—In 1891 there were eleven miles of streets in Philadelphia laid with a paving composed of vitrified brick. According to the report of the Chief of the Bureau of Highways of that city the brick costs about one-fifth less than asphalte, and it always presents a non-slippery surface. The chief difficulty is that the brick is not always of a uniform density. The bricks are joined together by Portland cement, which is found to be superior to the pitch formerly used.

LEGAL.

WORKMAN'S CLAIM FOR PAY IN LIEU OF NOTICE.

THE *City Press* of Wednesday last reports that, at the Mansion House Police-court, a labourer named Baker sued Mr. B. E. Nightingale, builder, for one hour's pay in lieu of notice.

Baker, in stating his case, did not assert that notice had not been given him, but admitted that as soon as he received it he ceased work, with a view, he said, of cleaning up his tools, and, although requested by the foreman, refused to resume work, claiming his right to do so under rule 5 of the new working rules for the building trades of London.

The Lord Mayor, without calling any further evidence, said such an interpretation of the rule was preposterous, and at once dismissed the case.

MEETINGS.

SATURDAY, DECEMBER 10.

Institution of Civil Engineers.—Students' visit to the Machinery and Inventions Division, South Kensington Museum. 2 to 4 p.m.

MONDAY, DECEMBER 12.

Society of Arts (*Cantor Lectures*)—Professor Vivian B. Lewes on "The Generation of Light from Coal Gas." IV. 8 p.m.

City and Guilds of London Institute.—Presentation of Prizes and Certificates, Merchant Taylors' Hall. 7.30 p.m.

Clerks of Works' Association (*Carpenters' Hall*).—Paper by Mr. G. H. Hughes. 8 p.m.

TUESDAY, DECEMBER 13.

Institution of Civil Engineers.—(1) Further discussion on Mr. John Rigby's paper on "The Manufacture of Small Arms." (2, time permitting). Mr. J. Emerson Dowson on "Gas Power for Electric Lighting." 8 p.m.

WEDNESDAY, DECEMBER 14.

Society of Arts.—Professor George Forbes on "The Utilisation of Niagara." 8 p.m.

St. Paul's Ecclesiological Society.—Objects of ecclesiological interest to be exhibited and described. 7.30 p.m.

Edinburgh Architectural Association.—Mr. T. Crichton Fulton on "The Electric Lighting of Large Buildings." 8 p.m.

THURSDAY, DECEMBER 15.

Society of Antiquaries.—8.30 p.m.

FRIDAY, DECEMBER 16.

Architectural Association.—Mr. F. Inigo Thomas on "The Formal Garden. 7.30 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

18,043.—DOOR CHAINS: *W. G. Gooch.*—This invention has for its object improvements in Door-chains, the chain-bolts being made adjustable and self-locking, so that in whatever position the chain may be placed the door to which it may be attached can only be opened the distance required, while the greater the pressure upon the door the tighter the chain becomes locked in the slide. The inventor provides an ordinary shaped slide, which is attached to the door in the ordinary position, as is also the chain to the door-post, but upon the loose end of the chain, in place of the ordinary button-end, the following is provided:—To the

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised.	Premium.	Designs to be delivered.
Gas Works ..	Vienna City Council..	8,000 fl. 5,000 fl. and 3,000 fl.	May 1593

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Roadmaking Works	Willesden Local Board	O. Claude Robson	Dec. 13
Oak Gates, Posts, &c. Lincoln	.....	Smiths, Gore, & Co.	do.
Cast-iron Pipes	Blackpool Corp.	J. Hesketh	do.
Thirteen Dwelling-houses, Cemetery-road, Wombwell	Barnsley British Co-operative Society	J. Robinson	do.
Cottage Residence, Chudleigh, Knighton, Devon	H. Hamlyn	S. Segar	do.
Dispensary and Completion of Residence, Belper	Dunshaughlin Union	A. Scott	do.
Road Works, Llantrisant	Pontypridd High. Bd.	J. Griffiths	do.
Additions to Dwelling-house, Salterford (Notts)	Hucknall Torkard Loc. Board	W. Swann	do.
Alterations to School Buildings	Holborn Union	*Official*	do.
Iron and Steel Plates and Bars, &c.	G. W. R. Co.	do.	do.
Additions, &c. Old Bridewell, Wrexham	Denbighshire C. C.	do.	Dec. 14
Colliery Stores, Fence Houses, Durham	Hetton Coal Co. Lim.	do.	do.
Excavating for and Laying Cast-iron Pipes, &c.	Blackpool Corp.	do.	do.
Fireclay, Bricks, Cement, &c.	Aberdeen Town Coun.	W. Dyack	do.
Staffordshire Blue Paving Bricks (50,000)	G. E. R. Co.	R. Collins	do.
Steam Piping, Laundry Machinery, Cooking Apparatus, &c. Patricroft	Barton-upon-Irwell Union	Mangnall & Littlewoods	do.
Road Metal, Kerbing, Flagging, &c.	Northampton Corp.	W. J. Brown	do.
Road Metal, &c	Woolwich Local Board	W. G. Forder	do.
Lavatory, &c. Hotwells	Bristol Corporation	F. Ashmead	do.
Villa Residence, Ballater	Dr. Carlyle	Grant Bros	do.
Electric Light Station	Blackpool Town Coun.	J. Wolstenholme	do.
Four Residences, Lightcliffe, near Halifax	.....	J. F. Walsh	Dec. 15
School Buildings, High Easter, Essex	The British Schools Committee	C. Pertwee	do.
Residence, Caerphilly	.....	Bruton & Williams	do.
*Engine Shed, Stourton	M. R. Co.	*Official*	do.
*Supply of Timber	London County Council	do.	do.
*Supply of Thames Ballast and Sand	do.	do.	do.
*Cartage and Disposal of Earth and Old Bricks	do.	do.	do.
*Supply of Ironwork	do.	do.	do.
*Supply of Best Red Sewer Bricks	do.	do.	do.
*Supply of Portland Cement	do.	do.	do.
*Supply of York Stone	do.	do.	do.
*Supply of Stoneware Pipes	do.	do.	do.
Surveyor's Stores	West Riding Asylums Committee	do.	Dec. 16
Cottage Police Station, Farnley	Leeds Corporation	do.	do.
Cast-iron Stop Posts, Edgeley Recreation Grounds	Stockport Corporation	J. Atkinson	do.
Formation and Draining of Cemetery	Denton and Haughton Local Board	G. H. Newton	Dec. 17
Additions to Halton Schools	Pemplenewsam & Austhorpe School Board	Chorley & Cannon	do.
*Works and Materials	St. George's Parish, Hanover-square	*Official*	do.
*Engine and Boiler Houses, Offices, &c.	Manchester Corporation Waterworks	do.	Dec. 19
Bar and Sheet Iron, &c. Cardiff	Powell Duffryn Steam Coal Co. Lim.	do.	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Administrative Offices and Iron Buildings, &c.	Croydon Corporation	*Official*	Dec. 19
*Underground Conveniences, Tottenham-court-road	Vestry of St. Pancras	do.	do.
*New Buildings for Isolation Hospital	Borough of Croydon	do.	do.
Dock Entrance, &c. Alloa Docks	North British Ry. Co.	Cunningham, Blyth, & Westland	do.
Chapel and Conversion of Chapel to Schools, Ingbirchworth, Yorks	.....	B. Stocks	do.
Cast-iron Tank, Iron Columns, &c. Hydraulic Power Station	Manchester Corp.	T. H. G. Berrey	do.
Bungalow, Constantine Bay, near Padston	E. C. Michiell	W. T. Martyn Mear	do.
Building Materials	Chester County Lunatic Asylum	*Official*	do.
*Construction of Sewer	Lewisham Bd. of Wks.	do.	Dec. 20
*Market Front and Stalls	Brentford Local Board	do.	do.
*Foundations of Artisan's Dwellings, Poplar	London County Council	do.	do.
*Three Blocks of Dwellings for Working Classes	do.	do.	do.
Additions, &c. to Co-operative Stores, Bishop Auckland	.....	Jas. Linday	Dec. 21
*Making-up and Paving Roads	Fulham Vestry	W. Sykes	do.
Supplying, Laying, &c. Fireclay and Cast-iron Pipes (5,710 lin. yds.)	Wick (N.B.) Corp.	Gordon & McBey	do.
Cement, Lime, Bricks, Drain Pipes, &c.	Nottingham T. C.	A. Brown	do.
Offices, Dispensary, &c.	Poplar Union	W. A. Hills & Son	do.
Granite Spalls (500 tons)	West Ham Union	*Official*	do.
*Iron Footbridges at Truro, Par, St. Erth and Marazion Stations	G. W. R. Co.	do.	do.
Laying 15-in. Stoneware Pipes, &c.	Tarporley (Cheshire) Local Board	H. Bancroft	Dec. 24
Road Metal, Kerbing, &c.	Oldbury Local Board	H. Richardson	Dec. 28
*Sewerage Works	Wetherby U.R.S.A.	A. E. Preston	do.
Intermediate School, Porth, S. Wales	.....	J. Rees	Dec. 30
Construction of Retort House, Roofs, &c.	Hartlepool Gas and Water Co.	T. Bower	Jan. 11
Road Construction, Bournemouth, Branksome Tower Estate	.....	Hawker & Mitchell	No date
Re-laying Sewer, &c. Frodsham	Runcorn U.R.S.A.	J. Farrington	do.
Sandstone, &c.	Governors of Cork District Lunatic Asylum	W. H. Hill	do.
Removal of Warehouses and Erection of New Buildings, Wine-street, Bristol	W. Verrier	H. J. Jones	do.
House and Factory, Rushden, Northants	.....	A. Sykes	do.
Twenty Semi-detached Residences, Chorlton-cum-Hardy, Manchester	Mr. Hastings	.....	do.
Alterations, &c. Chapel, Waterloo, Lancs.	The Committee	T. George & Son	do.
Gasholder (45,000 cubic feet), &c. Cinderford	Bilson Gas Light and Coke Co. Lim.	*Official*	do.
Repairs, &c. to Schools	Widnes School Board	do.	do.
Schools and Master's House, Burnopfield	Tanfield School Board	Davidson & Bendle	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
Surveyor	Castle Eden & Senham Highway Board	166*l.*	Dec. 13
*Road Foreman	Eastbourne Corp.	2*l.* 10*s.*	Dec. 15
*Clerk of Works	Bristol Corporation	.....	do.
Surveyor's Assistant	Bradford Corporation	100*l.*	Dec. 26
*Valuer and Surveyor, Ireland	Civil Service Com.	.....	Jan. 12 '93

Those marked with an Asterisk (*) are advertised in this Number. *Contracts, pp.* iv., vi., *&* viii. *Public Appointments, p.* xx.

end link of the chain one end of a lever is attached upon a pivot, the other end of the lever forming a disc, having an incline formed around its one face, and a circular hole in the centre forming a bearing for the pivot upon which it turns. At the one end of this pivot a square is formed, upon which a second disc is mounted, this disc having around its face a similar incline to the one upon the disc to which the lever is attached. To the other end of the pivot a button is attached of suitable shape for insertion in the hole at the end of the slide, but the disc being slightly larger than the hole the button passes into the slide while the disc remains outside, and while the cam faces of the disc are arranged to fit, sufficient space is provided between the button and the lever disc for the intermediate edges of the slot, upon which it then easily slides; but upon the chain being pulled the lever is drawn in a direction to cause the two inclines to press the disc tightly against the outside edges of the slot, and to draw the button against the inside edges, thereby wedging and locking the arrangement in any position it may be in when the chain is pulled.

21,718.—TILES: *C. Major.*—The object of this invention is to provide what are known as flat, plain, or Broseley tiles, which are capable of being used without cementing, and, whilst allowing for the passing off of moisture which may condense beneath the roof, are proof against the admission of rain or snow. The tiles are formed with ribs or projections at the upper and under sides of the portions uppermost when in place, the lower portion of the tiles being depressed, so that this portion will lie flat, or closely against the tiles beneath it. The projections on the said uppermost portion of the tile on the underside consist of lengthwise projections, which serve to allow water of condensation to pass down, and serve to support the tiles, so as to prevent distortion in their green state. On both the upper and under surfaces are also transverse ribs, arranged preferably towards the uppermost end of the upper surface of the tile, and lower down on the under surface of the tile. The ribs prevent the admission of snow or rain. They leave in them notches or openings which allow of the passage of water of condensation. To further protect the joints, other projections are made.

17,672.—WATER-CLOSETS: *J. & A. Duckett.*—The first part of this invention consists of an overhead tilting-tank mounted inside a square or other suitable tipper-box or receptacle. The tipper may occupy almost the whole area of the inside of the box consistent with the efficient working of the tipper. The feed water enters the tilting-tank, or tipper, which, when nearly full, tilts, throwing the water with great force down the conduit into and through the range of closets, thoroughly flushing the same. At one end of the tipper-box is formed a channel, or the like, running from side to side, and sloping in the direction of an outlet, preferably made at one corner of the tipper-box, and within the channel, so that the conduit from the said outlet to the first of the series of closets may be formed without a bend, to bring it into the corner of the closet at the rear of the seat. When the tilting-tank tips into the above channel it secures greater force than if the water was thrown into the tipper-box direct, and without the channel. The next part of the invention relates to the construction of pedestals, or pans, in connexion with slop water-closets, and consists in forming the interior of such pedestals or pans with converging sides, terminating in an outlet at the base, preferably above the floor level. This outlet is of about 2½ in. in width, and about 11 in. in length from front to back of the pedestal. The pedestal is placed above the basin of a waste-water-closet, and is preferably mounted upon or above an extension-pipe located between the two. The contracted outlet above described is of sufficient width and length to admit of the passage of excreta to the basin or trap, but will intercept large and solid articles.

19,698.—VENTILATORS OR COWLS: *A. J. Bond.*—This invention relates to ventilators or cowls in which stationary deflecting plates are employed. The uptake or passage for foul air, or such subdivision of the said uptake, has the following arrangement of deflecting plates applied at the part leading to the external air. A circular internal deflecting plate is arranged on a central line which would bisect an angle of 90 deg., and on both sides from the extremities of the said angle are arranged plates at angles extending towards circular internal deflecting plate, but not connected with it, and so leaving spaces between the inner extremities of the said plates and the circular internal deflecting plate for the passage of the foul air away from the room or other place. Opposite these said spaces a protecting plate is arranged, extending each way a considerable distance beyond such spaces for the purpose of guarding them, and forming a chamber through which the external air is deflected, by the outer extremities of the inner plates. Such air in passing creates a vacuum at the head of the shaft, which vacuum being filled from the lower volume of air, a powerful up-current is established, while at the same time the external air is deflected away from the outer side of the inner plates at angles, and circular internal deflecting plate towards the inner surface of protecting plate, and so prevents air from passing down the shaft.

14,656.—WHITE LEAD: *A. J. Smith.*—The main object of this invention is to provide for the production of a pure white lead containing the proper percentage of the actual pigment compound necessary to impart to the paint or pigment as high a covering power as is practically consistent with the preservation of the requisite capacity for effecting the solidification, or drying and hardening, of the oil used in the paint or pigment, such percentage being much larger than that contained in white lead made by any of the processes heretofore devised. For details of the process we must refer our readers to the specification, as they are too lengthy to be given here.

NEW APPLICATIONS FOR LETTERS PATENT.

November 21.—21,096, J. Hope, Window-sashes.—21,098, H. Hawgood, Fettered Brickwork.—21,105, P. Jackson, Street or Floor Paving.—21,106, W. Barroclough and A. Rhodes, Fireplaces.—21,164, A. Siebel, Material Suitable for Impermeable Partitions, Coverings, Roofs, Walls, Floors, &c.—21,165, E. Peers and F. Jukes, Drain or Sewage Pipes, and in Joints therefor

November 22.—21,203, P. Robinson, Production o Girders, Sectioned Metal, &c., in Iron and Steel and Other Metals.—21,204, P. Robinson, Production, or Part Production, of Girders and Sectioned Metal, in Iron or Steel, and in means to be employed therewith.—21,236, R. Williamson, Archimedean Screws.—21,245, C. Fitzgerald, Glazing.—21,254, W. Jackson, Chimney Pots.—21,283, H. Moreton, Securing Glass in Windows, &c.

November 23.—21,308, J. & A. Duckett, Gullies for Sinks, Baths, &c.—21,316, O. Linley, Laths.—21,392, R. Alpe and H. Price, Machines for the Manufacture of Screws.

November 24.—21,417, W. Bradford, Disinfecting Apparatus.—21,432, A. Fowler, Privies and Water-closets.—21,441, F. Golby, Ceilings.—21,458, W. Dalton, Bakers' Ovens.—21,465, G. Light, Syphon Drain Traps.—21,486, H. Parry, Kilns for Burning Lime.—21,492, C. Thornton, Indicators for Doors.—21,507, G. Stewart, Ventilation of Railway and other Tunnels.—21,510, R. Ecroyd, Substitute for Earthenware Tiles for Fireplaces, Walls, Lavatories, &c.—21,525, J. Anderson, Door Fastenings.—21,561, C. Sümmermann, Air-tight Closing Windows.

November 26.—21,580, W. Bevitt, Prevention of Downdraught in Chimneys.—21,583, P. Robinson, Production or part production of Girders and other Sectioned Metals, and Machinery therefor.—21,614, E. Ransome, Concrete-mixing Machine.—21,631, R. Hunter and J. Turnbull, Fire-grates.

PROVISIONAL SPECIFICATIONS ACCEPTED.

18,048, J. Parker, Manufacture of Mantel from metal, stone, slate, and other suitable non-combustible materials.—19,207, E. Beaumont, Window-fastenings.—19,310, H. Phillips, Chandeliers.—19,323, R. Moreland, Jun., and G. Auber, Window-sash Fastener.—19,355, W. Petley, Sash-fastener.—19,622, J. Yeadon and W. Adgie, Cements, &c.—19,856, F. Taylor, Nails.—19,876, W. Horn, Tool for Pointing Masonry.—19,879, F. Sage, Protectors for the Legs of Wheelbarrows, &c.—19,880, W. Fuller, Making House-connexions with Electric-lighting Mains.—20,046, F. Frier, Stone-dressing Machines.—20,059, H. Ford, Sliding and Swinging Window-sashes, and Frames therefor.—20,082, A. Gwatkin, Wall Papers.—20,169, J. Bainbridge, Chisels and like Instruments or Tools, particularly in securing them to their handles.—20,441, S. and H. Pochin, Tiles.—20,448, W. Horn, Metallic Ceilings or Walls.—20,485, H. Hinds, Frames of Turning Saws.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

21,674, T. Gawthorp, Sash-fastener.—8, G. Harrington, Cowl and Shaft Arrangements for Ventilation.—854, E. Cooper and E. Turrall, Door-springs

and Checks.—1,024, J. Evans, Utilising Waste Heat for Heating Buildings.—1,342, E. Hunt, Gasaliers and Chandeliers.—14,132. W. Bramley, Detachable Handles for Saws.—18,803, K. Alsdorff, Fireproof Walls and Ceilings.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

NOVEMBER 28.—By *Harman Bros.*: 75, Shakespeare-rd., Stoke Newington, f., 450*l.*; "The Bungalow," Woodberry Down, Stamford Hill, u.t. 90 yrs., g.r. 10*l.*, 1,000*l.*; 1 and 2, Westbourne-villas, Forest Hill, u.t. 60 yrs., g.r. 6*l.*, 560*l.*—By *Furber, Price, & Furber*: 18 and 19, Walter's-st., Stepney, u.t. 22 yrs., g.r. 1*l.*, 330*l.*; 5 and 7, Grafton-rd., Kentish Town, u.t. 48 yrs., g.r. 10*l.* 10s., 560*l.*—By *J. Hibbard & Sons*: 90, Effingham-rd., Hornsey, u.t. 98 yrs., g.r. 5*l.*, 245*l.*; 28, Plimsoll-rd., Finsbury Pk., u.t. 78 yrs., g.r. 5*l.* 10s., r. 34*l.*, 365*l.*

NOVEMBER 29.—By *C. W. Davies*: 8 and 12, Burnard-pl., Holloway, f., r. 42*l.*, 515*l.*—By *E. & S. Smith*: 53, Aden-grove, Stoke Newington, u.t. 79 yrs., g.r. 5*l.* 5s., r. 30*l.*, 285*l.*; 17, Baker-st., Clerkenwell, u.t. 19 yrs., g.r. 5*l.*, 200*l.*; 39, Devonshire-st., Bloomsbury, f., r. 75*l.*, 1,050*l.*; 14, London-rd., Northfleet, u.t. 58 yrs., g.r. 6*l.*, r. 48*l.*, 310*l.*—By *F. Long & Son*: 15 and 17, Campdale-rd., Tufnell-pk., u.t. 82 yrs., g.r. 15*l.*, r. 90*l.*, 870*l.*—By *Battam & Co.*: f.g.r. of 34*l.*, Glenthorne-rd., Hammersmith, reversion in 78 yrs., 780*l.*; f.g.r. of 63*l.*, Beadon-rd., ditto in 78 yrs., 1,460*l.*; f.g.r. of 10*l.* 10s., Gayford-rd., ditto in 87 yrs., 260*l.*; f.g.r. of 26*l.*, ditto in 89 yrs., 635*l.*; f.g.r. of 5*l.* 5s., Clayton-ter., ditto in 89 yrs., 130*l.*—By *R. A. Notley*: F.g.r. of 10*l.* 10s., Clapham-rd., ditto in 8 yrs., 560*l.*; f.g.r. of 7*l.* 5s., Lingham-st., ditto in 6 yrs., 350*l.*; f.g.r. of 10*l.* 10s., ditto in 8 yrs., 620*l.*; f.g.r of 6*l.*, ditto in 9 yrs., 330*l.*; f g.r. of 10*l.*, Lingham-st. and South Esk-st., ditto in 8 yrs., 860*l.*; f.g r. of 22*l.* 12s. 9d., Eastcote-st. and Crossford-st., ditto in 9 yrs., 1,400*l.*; f g.r. of 30*l.*, Lingham-st., ditto in 76 yrs., 760*l.*; 68 and 70, Lingham-st., f., r. 60*l.* 12s., 560*l.*—By *Thurgood & Martin* (at Lewes): The farms known as "Foxhunt" and "Summersbrook," near Uckfield, 476 acres, f., 9,300*l.*

NOVEMBER 30.—By *Rushworth & Stevens*: Nos. 6 and 7, New Bond-st., part f. and remainder Corporation leaseholds, r. 600*l.*, 14,500*l.*; i.g.r. of 60*l.*, Albion-rd., Hampstead, u.t. 42 yrs., no g.r., 1,250*l.*—By *St. Quintin & Son*: No. 20, Hyde Pk.-gardens (and Stabling), u.t. 41 yrs., g r. 2*l.*, 8,500*l.*—By *Giddy & Giddy*: 41 and 43, Grove-lane, Camberwell, f., 650*l.*—By *Tobin & Sons*: 29, Lindley-st., Mile End, u.t. 8 yrs., g.r. 2*l.*, 50*l.*; 7 to 10, Abingdon-st., Hackney, u.t. 19 yrs., g.r. 12*l.*, 250*l.*—By *R. Tidey & Son*: 4, Canterbury-rd., Balls Pond, u.t. 59 yrs., g.r. 3*l.* 10s., r. 30*l.*, 290*l.*; 61, Hanley-rd., Hornsey Rise, f., r. 40*l.*, 625*l.*; 64, and 65, Ashburton-grove, Holloway, u.t. 48 yrs., g.r. 8*l.* 8s., r. 54*l.*, 420*l.*; 40 to 43, St. Helena-pl., Clerkenwell, u.t. 14 yrs. g r 75*l.*, 5*l.*; 44, St. Helena-pl., u.t. 25 yrs, g.r. 6*l.*, 115*l.*; 31 and 37, Custance-st., Hoxton, u.t. 13 yrs., g.r. 16*l.*, 45*l.* By *Inman Sharp, Harrington, & Roberts* (at Brighton): 75 and 76, Middle-st., Brighton, c., r. 120*l.*, 1,690*l.*; enclosures of meadow land, Uckfield, Sussex, 4a. 2r. 34p., c., r. 15*l.*, 275*l.*

DECEMBER 1.—By *Beadel & Co.*: 10, Mornington-cres, Hampstead-rd., u.t. 26 yrs., g.r. 7*l.*, r. 60*l.*, 520*l.*; f. site, Adam-st., Newington, area 3,000 ft., 400*l.*; 46, 47, and 48, Adam-st., f., r. 97*l.* 18s., 1,115*l.*; 28, 29, and 30, Adam-st., f., r. 53*l.* 8s., 415*l.*; 14, Ripley-st., and Ripley-st. Mews, 860*l.* — By *C. P. Whiteley*: 60 to 70 (even), Angel-lane, Stratford; and 2 and 4, Western-st., u.t. 18½ yrs., g.r. 12*l.*, 1,000*l.*; "The Lion" public-house, Angel-lane, c., r. 60*l.*, 1,800*l.* —By *F. J. Bisley & Sons*: 82, 84, and 86, White Post-lane, Hackney, u.t. 67 yrs., g.r. 9*l.*, 300*l.*; 50, St. James's-rd., Bermondsey, u.t. 43 yrs., g.r. 5*l.*, 375*l.*; 17 and 18, Martin-st., u.t. 46 yrs., g.r. 5*l.* 10s., 450*l.*; 165 and 167, St. James's-rd., u.t. 40 yrs., g.r. 7*l.*, 460*l.*; 114 to 124 (even), St. James's-rd., u.t. 41 yrs., g.r. 21*l.*, 1,685*l.*; 22, 24, and 26, Debnam's-rd., Rotherhithe, u.t. 59 yrs., g.r. 9*l.*, 165*l.*; 221, 223, and 225, New-rd., u.t. 32 yrs., g.r. 7*l.* 10s., 1,445*l.*; 76 to 81, West-st., Bermondsey, u.t. 25 yrs., g.r. 18*l.*, r. 158*l.* 8s., 820*l.*—By *Newbon & Co.*: F.g.r. of 22*l.* 10s., Archway-rd., Holloway, reversion in 77 yrs., 590*l.*; 18, Keppel-mews North, Gower-st., u.t. 9 yrs., g.r. 6*l.* 12s., r. 35*l.*, 95*l.*; 87, Roman-rd., Holloway, u.t. 69 yrs., g.r. 6*l.* 10s., r. 30*l.*, 315*l.*; 52, 58, 60, and 68, Grove-rd., u.t. 56 yrs., g.r. 30*l.*, r. 155*l.*, 1,115*l.*; 1, Ingleby-rd., u.t. 56 yrs., g.r. 6*l.*, r. 30*l.*, 240*l.*; 22 and 48, Isledon-rd., u.t. 50 yrs., g.r. 13*l.*, r. 76*l.*, 655*l.*; 24 and 54, Fonthill-rd., u.t. 72 yrs., g.r. 14*l.*, r. 66*l.*, 555*l.*; 44, 48, 50, and 52, Ennis-rd., Finsbury Pk., u.t. 74 yrs., g.r. 26*l.*, r. 130*l.*, 1,070*l.*; 4, 6, and 8, Perth-rd., u.t. 74 yrs., g.r. 24*l.*, r. 111*l.*, 865*l.*; 49, Woodstock-rd., Stroud Green, u.t. 74 yrs., g.r. 6*l.* 10s., r. 36*l.*, 280*l.*; 63 and 65, Highbury-hill, Highbury, u.t. 69 yrs., g.r. 25*l.*, r. 130*l.*, 1,000*l.*; 79, Highbury-hill, u.t. 69 yrs., g.r. 12*l.* 10s., r. 70*l.*, 475*l.*; 81, 83, and 85, Highbury-hill, u.t. 69 yrs., no g.r., r. 265*l.*, 1,300*l.*; 43, Rosoman-st., Clerkenwell, u.t. 1 yr., r. 50*l.*, 46*l.*—By *Protheroe & Morris*: 4, 6, and 8, Gifford-st., Islington, u.t. 52 yrs., g.r. 18*l.*, 820*l.*; 47, Southborough-rd., Hackney, u.t. 50 yrs., g.r. 6*l.*, r. 32*l.*, 325*l.*; 38, Acre-rd., Kingston-on-Thames, f., r. 26*l.*, 210*l.*—By *C. E. Joy*: 48, 50, and 52, Tavistock-cres., Westbourne-pk., u.t. 71 yrs., g.r. 28*l.* 10s., r. 130*l.*, 665*l.*—By *Wilkinson, Son, & Welch* (at Brighton): 38, Grenville-pl., Brighton, f., r 38*l.*, 720*l.*

DECEMBER 2.—By *E. Evans*: Two plots of f. land, Duncombe-rd., Brockley, 101*l.*—By *Ball, Norris, & Hadley*: 8A, Drayton-pk., Highbury, u.t. 92 yrs., g.r. 12*l.*, r. 48*l.*, 400*l.*—By *Robert Reid*: 153, St. John-st., Clerkenwell, f., r. 68*l.*, 800*l.*; 2 and 4, Tachbrook-st., Pimlico, u.t. 76 yrs., g.r. 24*l.*, r. 155*l.*, 1,700*l.*; 36, Tachbrook-st., and 1 to 4, Luscombe-mews, and i.g.r. of 8*l.* 10s., u.t. 36 yrs., g.r. 24*l.* 10s., r. 108*l.* 10s., 1,100*l.*; 97, Cambridge-st., u.t. 38 yrs., g.r. 8*l.*, r. 60*l.*, 580*l.*; 52 and 53, Northumberland-pl., Bayswater, u.t. 53 yrs., g.r. 13*l.*, r. 94*l.*, 825*l.*

[Contractions used in these lists.—F.g.r. for freehold ground-rent; i.g r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold: l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G. ton	9/0/0	8/0/0
Teak, E.I.. load	9/10/0	15/0/0
Sequoia, U.S.ft.cu.	2/4	3/0
Ash, Canada load	2/10/0	4/0/0
Birch, do.	3/5/0	4/10/0
Elm, do.	3/10/0	4/15/0
Fir, Dantzic, &c.	1/10/0	3/10/0
Oak, do.	3/0/0	5/5/0
Canada.....	5/10/0	7/0/0
Pine, Canada red	2/10/0	3/10/0
Do, yellow	2/10/0	5/0/0
Lath, D'ntzic, fath	5/0/0	6/0/0
St. Petersburg	5/0 0	7/0 0
Deals, Finland 2nd & 1st std 100	7/10/0	9/10/0
Do, 4th & 3rd..	7/0/0	8/0/0
Do. Riga	6/10/0	8/0/0
St. Petersburg, 1st yellow ..	10/10/0	14/10/0
Do. 2nd yellow	8/0/8	9/10/0
Do. white	7/0/8	9/10/0
Swedish	7/10/6	16/0/0
White Sea	8/0/0	17/0/0
Canada, Pine 1st	20/0/0	26/10/0
Do. do. 2nd....	14/10/8	18/0/0
Do. do. 3rd, &c.	7/10/0	10/0/0
Do. Spruce. 1st	8/10/8	11/0/0
Do. do. 3rd & 2nd.....	6/10 0	8/0/0
New Brunswick	6/10/0	7/0/0
Battens, all kinds	3/10/8	15 10 0
Flooring Boards, sq., 1 in. prep. 1st	0/8/0	0/14/0
Do. 2nd.....	0/7/0	0/10/0
Other qualities	0/3/0	0/7/6
Cedar, Cuba ..ft.	/3½	/4½
Honduras, &c.	/3½	/4
Mahogany, Cuba.	/4½	/6½
St. Domingo, cargo av	/4	2/0
Mexican do. do	/4	/5
Tobasco do. do	/4½	/7
Honduras do..	/5	/6½
Box, Turkey ton	4/0/0	13/0/0
Rose, Rio.....	10/0/0	20/0/0
Bahia	9 0 0	18/0/0
Satin, St. Domingo ....ft.	0/0/7	0/1/8
Porto Rico	0/0/7	0/1/6

TIMBER (*continued*).		
Walnut, Italian..	0/0/3½	0/0/7
METALS.		
IRON—Pig, in Scotland .....ton	2/1/9	0/0/0
Bar, Welsh, in London.....	5/17/6	6/0/0
Do. do. at works in Wales	5/7/6	5/10/0
Do. Staffordshire, in London	6/5/0	6/15/0
COPPER—British, cake and ingot	51/10/0	52/0,0
Best selected ..	52/10/0	53/0/0
Sheets, strong..	60/0/0	0/0/0
Chili, bars	47/11/3	47/18/9
YELLOW METAL lb.	0/0/5	0,0/5½
LEAD—Pig, Spanish....ton	10/0/0	10/1/3
English, com. brands	10/2/6	0/0/0
Sheet, English, 8 lbs. per sq. ft. and upwards ..	11/10/0	0/0,0
Pipe	12/0/0	0/0/0
ZINC—English sheet .....ton	22/15'0	0/0/0
Vieille Montagne.....	23/5/0	0,0/0
TIN—Straits	91/5/0	91/15/0
Australian	91/15/0	92/5/0
English Ingots.	96/0 0	96/10 0
Banca	94/0/0	94/10/0
Billiton	93/10/0	94/0/0
OILS.		
Linseed .....ton	18/7/6	0'0/0
Cocoanut, Cochin	25/10/0	0/0/0
Do. Ceylon	23/15/0	0'0'0
Palm, Lagos	26/10/0	0/0/0
Rapeseed, English pale	25/0/0	25/10/6
Do. brown	23/10/0	0,0/0
Cottonseed ref...	18/5/0	0,0,0
Oleine	20/10/0	21/0/0
Lubricating, U.S.	4/0/6	5/0/0
Do. refined	5/10/6	12/0/0
TAR—Stockholm barrel	0/17.6	0/18/6
Archangel	0/12/6	0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 12 *noon on Thursdays.*]

ANERLEY (Surrey).—Accepted for the erection of a pair of villa residences for Mr. D. L. Gooch. Mr. R. Peters, architect, 73, Wool Exchange Coleman-street, E.C.:—
Bettidge £1,400 0 0

BARNSLEY.—Accepted for the erection of two shops and six dwelling-houses, for the Barnsley British Co-operative Society. Mr. Jno. Robinson, architect, Wombwell, near Barnsley. Quantities supplied:—

Mason—F. Robinson, Birdwell	£1,079 0 0
Joiner—W. Hammerton, Worsbro' Dale.....	556 0 0
Slater—C. Kemp, Swinton.....	78 0 0
Plumber—B. Dennison, Barnsley	74 0 0
Plasterer—J. M. Partlin, Platt's Common.....	95 10 0
Painter—Calvert, Barnsley	29 0 0

BECKENHAM.—For additions and decorations to "Beckville," Southend-road, for the Planet Building Society. Mr. J. W. Brooker, architect, London Bridge, S.E.:—

Palmer	£573	Kick	£334
Syme & Duncan	467	Copeland*.....	295
Graham.....	413		

* Accepted.

BEVERLEY (Yorks).—For 500 ft. piling and boarding on south side of bank, for the Corporation. Mr. Wm. Oxtoby, Borough Surveyor, Guildhall, Beverly Yorks:—

W. Gradwell	£357 10	Robt. Thacker	£232 16
J. R. Foley	299 0	W. H. Harrison	200 0
John Elliott	285 12	Wm. Porter, Beverley*..	187 10
James Thompson.....	285 0		

* Accepted.

BRENTWOOD.—For drainage works at the Hackney Union Training Schools, Brentwood, Essex, for the Guardians of the Hackney Union. Mr. W. A. Finch, architect, 76, Finsbury-pavement, E.C.:—

J. West, jun.....	£2,500	G. Flaxman	£1,685
Sheffie'd Bros.	2,275	A. Porter	1,685
Woods & Co.	1,896	G. Jennings, Lambeth * ..	1,490

* Accepted.

BRENTFORD.—For paving works, Stile Hall Estate, for the Local Board. Mr. J. H. Strachan, Surveyor, Clifden House, Boston-road, Brentford:—
Victoria Stone Company, Kingsland-road, N.
[Accepted at schedule of prices from among fourteen tenders.]

BUCKINGHAM.—For the erection of a residence at Buckingham for Mr. G. H. De'ath. Mr Charles Bell, architect:—

Unitt & Savage.....	£1,922	Kingerlee*	£1,800
Grist.....	1,910		

* Accepted.

BULWELL (Notts).—For street-making in the town, for the Beech House Land Society. Mr. Edwin Clarke, architect, 16, Fletchergate, Nottingham. Quantities by the architect:—

R. Tilley	£694 0 0	F. Measom.....	£457 0 0
A. Shaw	570 0 0	S. Thumbs.....	455 0 0
S. Simpson	485 0 0	Cope & Raynor	378 16 8
J. Bradley	478 0 0	T. G. Allenson	254 18 6

(The last six have been asked to tender again on revised quantities.)
[Architect's estimate, £445.]

CASTLEFORD (Yorks.).—Accepted for the erection and completion of a new school, Wheldon-road, for the Castleford School Board. Mr. R. M. McDowall, architect, Carlton-street, Castleford. Quantities by Mr. W. Hoffman Wood, Leeds:—

For excavating, mason, and bricklayer's works— Watson & Elsworth, South Milford	£3 307 0 0
Carpenter and joiner—W. Wilson & Son, Castleford..	1,033 13 0
Plumber and glazier and hot-water engineer—W. Wilson & Son, Castleford	602 1 0
Tiling—Mr. Jas. Season, Huns et, near Leeds	348 14 0
Plastering—J. Sinns & Sons, Castleford	126 10 0
Painter—Mr. John H. Butler, Pontefract	50 1 5
Total.....	£5,467 19 5

CHELTENHAM.—For the construction of a tunnel under Evesham-road, and excavating works at Marle Hill (18,000 cubic yards), for the Town Council. Mr. Joseph Hall, C.E., Borough Surveyor, Municipal Offices, Cheltenham:—

	Lake.		Tunnel.	
Charles Braddock†	£3,022 10 0	....	£337 3 2	
Brown, Phillips, & Co†.....	2,722 10 0	....		
C. Bullough & Co.	2,213 5 0	....	345 19 0	
James Crowe	1,982 5 7	....	392 13 0	
Mark Williams.....	1,784 0 0	....	—	
John Strachan Cardiff.....	1,650 0 0	....	340 0 0*	
Charles Malvern & Sons	—	....	345 0 0	
Charles Young†.....	887 1 8	....	98 10 0	
J. K. Baker, Birkenhead	1,552 10 0*	....	437 6 6	

* Accepted. † Informal.

CHATHAM.—For rebuilding the "Globe" Hotel, for Messrs. E. Winch & Sons. Mr. G. E. Bond, architect, Rochester. Quantities by the architect:—

West Bros.....	£3,079	T. Callund & Son.....	£2,740
W. C. Snow	2,798	Naylar & Son	2,728
W. King.....	2,795	E. D. Seagars	2,445
A. F. Smith	2,772	C. E. Skinner, Chatham*..	2,368

* Accepted.

CHERTSEY.—For the erection of hospital buildings, Ottershaw, for the Rural Sanitary Authority. Mr. Chas. Welch, architect. Quantities by architect:—

J. Harris	£4,875	B. Ingram	£4,100
H. Brown	4,600	H. G. Nesmyth	3,993
G. Gray	4,549	Jas. H. Jarvis	3,993
J. F. Collieson	4,350	R. J. Hunt	3,920
B. E. Nightingale	4 256	T. Wells	3,900
M. L. Ingram	4,251	Knight & Son, Chertsey*..	3,900
Jas. Martin	4,154		

* Accepted.

CLACTON-ON-SEA.—Accepted for the erection of a private school and house in Carnarvon-road, for Mr. Joseph Newman. Mr. T. H. Baker, architect, Clacton-on-Sea:—
Mark Potts £868 0 0

CLACTON-ON-SEA.—Accepted for completing three houses and shops in Rosemary-road, for Mr. Joseph Newman. Mr. T. H. Baker, architect, Colchester:—
Mark Potts £782 6 1

COWDEN (Kent).—Accepted for the erection of a residence for Mr. F. C. Nutter. Mr. Richard Peters, architect, 73, Wool Exchange, Coleman-street, E.C.:—
Lucas & others £2,000 0 0

DARTFORD.—For the erection of a pair of cottages, Gore Farm, for the Managers of the Metropolitan Asylums Board. Messrs. A. & C. Harston, Architects, 15, Leadenhall-street, E.C. Quantities not supplied:—

C. Miskin.....	£892	R. & J. Butler	£795
T. Knight.....	839	J. Ellingham, Bexley Heath*	765
A. Osborne & Co.	825		
W. Johnson & Co.	823		

* Accepted.

DEWSBURY.—Accepted for the erection of twelve houses, &c. Earlsheaton, for the Dewsbury Pioneers Industrial Co-operative Society. Messrs. Holtom & Fox, architects, Westgate, Dewsbury. Quantities by the architects:—

Mason—John Pickersgill, Ossett*	£1,400 0 0
Joiner—C. H. Seeker, Dewsbury.....	388 10 0
Plumber—J. Shepley, Dewsbury.....	80 0 0
Plasterer—J. Richardson, Dewsbury	93 0 0
Slater—G. Hargreaves, Dewsbury	73 0 0
Painter—E. Oldroyd, Dewsbury.....	25 0 0

* For Delph stone.

DOVER.—For the removal of existing wall and rebuilding same with iron fencing, &c., for the Town Council:—

H. Stiff.....	£385 0	H. Richardson	£213 0
J. J. Hall	319 11	G. Lewis & Sons*.....	210 0
W. Bromley	260 0	[All of Dover.]	

* Accepted.

ENFIELD.—For kerbing, channelling, and making-up Upper Gordon-road (1,800 ft. long), for the Local Board. Mr. R. Collins, Surveyor, Court House, Enfield:—

Parker Bros.....	£1,950 0	Geo. Bell	£1,579 0 0
J. Bloomfield	1,759 16 5	W. Nicholls	1,571 0 0
W. Griffiths.....	1,740 0 0	E. J. Betts.....	1,565 0 0
J. Neave	1,699 0 0	J. Jackson, Enfield*.	1,468 14 8

* Accepted.
[Surveyor's estimate, £1,678.]

FELIXSTOWE.—For forming, &c., new roads, &c., for Mr. T. H. Tacon. Mr. H. Miller, jun., surveyor, 16, Museum-street, Ipswich. Quantities by the surveyor:—

Trew & Co.	£387 10 0	Gibbons	£270 0 0
Wink	385 0 0	Etheridge, Rotherhithe*.....	250 0 0
Moran	380 0 0		
Fiske	370 0 0		

* Accepted.

FULHAM.—For granite and other paving works at the Western Hospital, Seagrave-road, Fulham, S.W., for the Metropolitan Asylums Board. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C.:—

Mowlem & Co.	£330	Nowell & Robson*.....	£184
Griffiths	208		

* Accepted.

HENDON.—For fencing in Recreation Ground, Child's-hill, for the Hendon Local Board. Mr. S. S. Grimley, Surveyor:—
Hill & Smith, Brierly-hill, Stafford-shire.*
* Accepted according to schedule of prices. (There were eight other tenders.)

HEREFORD.—For erecting a model bakery in West-street, Hereford, for the India and China Tea Company. Mr. W. W. Robinson, architect 10, King-street, Hereford:—

H. Welsh	£1,939	Andrews & Rudge	£1,658
Bowers & Co.	1,933	Beavan & Hedges*	1,645
J. Davies	1,679		

* Accepted.
[All of Hereford.]

HERNE BAY.—For the erection of a house at Eddington, near Herne Bay. Mr. H. Farley, architect, Richmond-street, Herne Bay:—

Welby	£335 0	Ing'eton	£223 10
Jordau	247 10	F. J. Philpott*	214 8
Mohun & Knight	244 0	[All of Herne Bay.]	

* Accepted.

HERNE BAY.—For the erection of two villa residences in Station-road, Herne Bay. Mr. H. Farley, architect, Richmond-street, Herne Bay:—

Amos & Foad.....	£1,650 0 0	E. T. J. Adams	£890 0 0
A. Hill	1,036 0 0	Mohun & Knight	844 0 0
T. Cornelius	930 0 0	A. S. Ingleton.....	827 0 0
C. Farley	896 0 0	F. J. Philpott, Herne Bay (accepted).....	764 9 9
C. Welby	896 0 0		

HERNE BAY.—For the erection of a house in Throwby-road, Herne Bay. Mr. H. Farley, architect, Richmond-street, Herne Bay:—

Welby	£356 0	Taylor	£298 10
Adams.....	349 0	Ingleton (accepted)	287 0

[All of Herne Bay.]

HOUGHTON-LE-SPRING.—For main sewerage and sewage disposal works for the townships of Newbottle, Fencehaw, West Herrington, Hetton-le-Hole, East Rainton, and Moorsley, for the Houghton-le-Spring Union Rural Sanitary Authority, per plans, &c., prepared by Mr. D. Balfour, M.Inst.C.E., 3, St. Nicholas-buildings, Newcastle-on-Tyne:—

	Northern Section.	Southern Section.	Total.
Jas. Tough	£21,732	£12,622	£44,354
H. Cooke & Co.	17,640	21,920	39 560
J. & T. White.....	16,449	21,251	38,690
George Bell.....	15,500	19,500	35,000
D. N. Brims	14,989	18,935	33,924
F. S. Brunton.....	14,660	18,940	33,600
J. T. Simpson.....	14,428	18,351	32,780
J. Carrick	13,760	17,232	30,992
R. Hudson, jun., Sunderland (accepted)	12,464	16,756	29,220
Engineer's estimate..	12,675	17,275	29,950

KING'S NORTON (Birmingham).—For the erection of a water-tower and the enclosing of water-tanks, and the sinking of a well, &c., at Shenley Fields, for the Union Guardians. Messrs. Henry Lee & Thornbury, engineers, 38, Bennett's-hill, Birmingham:—

Lane Bros.	£397	M. H. Grant, Birmingham*.	£375

* Accepted subject to approval of Local Government Board.

LEYTONSTONE.—Accepted for the completion of pair of houses, Clarendon-road. Mr. R. Peters, architect, 73, Wool Exchange, Coleman-street, E.C.:—
Howlett & Sons £575 0 0

LONDON.—For the erection of a pupil teachers' centre and laundry centre on the Alma site, Southwark Park-road, and for enclosing, draining, &c., additional land, for the School Board for London. Mr. T. J. Bailey, Architect:—

		If brickwork be built in cement, add
F. & H. F. Higgs	£10,270	£193
J. Marsland	10,255	195
Holloway Bros.	10,015	219
Smith & Sons	9,824	243
Co-operative Builders, Ltd.	9,798	170
Hart Bros.	9,794	205
Holliday & Greenwood	9,687	225
J. Tyerman	9,550	243
Lather Bros.	9,489	225
W. Downs, Hampton-street, Walworth-road	9,462*	200*

* Recommended by the Works Committee for acceptance.

LONDON.—For the erection of stabling, &c., City, for forty-one horses, for Mr. C. Fry. Mr. Richard Peters, architect, 73, Wool Exchange, Coleman-street, E.C.:—

Josolyne & Young	£5,578	Watson	£4,750
Jarvis & Sons	5,084	Howlett & Sons	4 500
Braid & Co.	4,956		

LONDON.—For enclosing, levelling, draining, and tar-paving land in connexion with the Wirtemburg-street School, Clapham, and for erecting new water-closets, for the School Board for London. Mr. T. J. Bailey, Architect:—

Lathey Bros.	£1,130	Whitehead & Co.	£993
Smith & Sons	1,091	J. Tyerman	925
W. Hammond	1,059	Garrett & Son	900
E. Parsons	1,050	E. Triggs, 95, The Chase, Clapham*	797
H. Mallett	1,008		

* Recommended by the Works Committee for acceptance.

LONDON.—For the re-erection of No. 33, Mansell street, Aldgate, for Mr. H. Merceron. Mr. Richard Peters, architect, 73, Wool Exchange, Coleman-street, E.C.:—

Josolyne & Young	£1 696	Howlett & Sons	£1,275
Richardson Bros.	1,588	Watson*	1,224
Jarvis & Sons	1,464		

* Accepted.

LONDON.—Accepted for alterations and additions at the "Prince Imperial," Rotherhithe New-road. Mr. H. Roberts, architect, 113, Lewisham-road:—
Edwards & Medway £1,260 0 0

LONDON.—For alterations and additions to the "Half Moon" public-house, Holloway-road. Mr. E. E. Niblett, architect, 11, Union Chambers, Wormwood-street, E.C.:—

Edwards & Medway	£1,059	Courtney & Fairbairn	£1,038
H. Burman & Sons	1,050	Evans (Too late)	

LONDON.—For alterations and extension of bars and billiard saloon at the "Monarch" public-house, Hornsey-road, for Mr. T. Hooper. Mr. George Carter, architect, 513, Holloway-road, N.:—

Macfarlane Bros.	£1,265	Borehan	£1,012
Tod	1,160	Stevens Bros., Tonge Park*	953
Dearing & Son	1,065		

* Accepted.

LONDON.—For re-instatement of warehouse after fire, Hewett-street, Curtain-road, for Messrs. Thomas & Co. Mr. Charles Bell, architect:—

Allen & Son	£865	Kent*	£735
Holliday & Greenwood	775		

* Accepted.

LONDON.—Accepted for alterations and additions to "The Fountain," Lambeth-walk, No. 1 Contract, for Mr. S. Branson. Mr. E. E. Niblett, architect, 11, Union Chambers, Wormwood-street, E.C.:—
Courtney & Fairbairn £735 0 0

LONDON.—Accepted for alterations and additions to the "Surrey Arms" Tavern, Thomas-street, Kennington. Mr. E. E. Niblett, architect, 11, Union Chambers, Wormwood-street, E.C.:—
H. Burman & Sons £100 0 0

LONDON.—For the erection of granaries, at Edwards-square, Kensington, W., for Mr. John Crowle. Mr. Charles R. Guy Hall, architect, 13, St. Alban's-road, Kensington, W.:—

Douglas	£624 2 2	Barker & Co.	£525 0 0
Stafford Hill	557 0 0	Leslie & Co.	523 0 0

PORTSMOUTH.—For the erection of a wrought-iron fence, gates, &c., at Clarendon-road, for the Urban Sanitary Authority. Mr. Philip Murch, Borough Engineer, Town Hall, Portsmouth:—

G. Jeram	£343 3 6	McKinlay & Co.	£225 0 0
W. W. Learmouth	329 18 0	C. Gilham	223 6 0
E. A. Knight	304 10 0	W. Beattell	220 10 0
Goddard & Massey	300 0 0	J. Sherwell	214 16 0
J. Dugan	228 0 0	S. Grossmith, Daniel-street, Portsea*	200 0 0
T. P. Hall	227 0 0		

* Accepted.

LONDON.—For alterations and additions to the "Hawarden Castle" Tavern, Gower-place, N.W., for Mr. W. Whittick. Mr. J. W. Brooker, architect, London Bridge, S.E.:—

W. Croaker	£2 299	Burman & Son	£2,111
Battley, Sons & Holness	2,278	Edwards & Medway*	1,796
Drew & Cadman	2,224		

* Accepted with modifications.

LONDON.—Accepted for an engine and boiler house, &c., and deepening present well and boring, and lining with iron cylinders, &c., for the St. Leonard's, Shoreditch Union Guardians. Mr. F. J. Smith, architect, 17B, Great George-street, Westminster, S.W.:—
J. Ivory, Dalston £487 10 0
Engineer's Work.
Tilley & Sons, Walbrook 1,286 13 10

LONDON.—For the erection of a wood floor over swimming-bath, for the Commissioners for Baths and Washhouses for the Parish of St. Mary, Islington. Mr. A. Heselt Tiltman, architect. Quantities supplied by Mr. John Leaning:—

Davis	£375 0 0	Macfarlane	£285 0 0
Jones & Tresise	365 10 6	Houghton	282 0 0
Snewin Bros. & Co.	351 0 0	Sheffield	265 0 0
Spencer & Co.	343 0 0	Lascelles & Co.	249 0 0
Tout	336 0 0	Wall	247 0 0
Castle	297 0 0	Richardson	219 0 0
Pryor	290 0 0		

LONDON.—For alterations and decorations to residence, Neville-street, Kensington, for Mr. W. Sharpe. Mr. R. Peters, architect, 73, Wool Exchange, Coleman-street, E.C.:—

Josolyne & Young	£269	Knight & Co.*	£2.9
Taylor	250		

* Accepted.

LONDON.—For providing a new covered playground for the infants' department of the Monnow-road School, Bermondsey, for the School Board for London:—
J. Marsland £196 0 0
J. Tyerman, 220, Walworth-road* 180 0 0
* Recommended by the Works Committee for acceptance.

LONDON.—For additional cooking apparatus at the Infirmary, High-street, Homerton, E., for the Guardians of the Hackney Union. Mr. W. A. Finch, architect, 76, Finsbury-pavement, E.C.:—

Berry & Son	£130	G. Flaxman, Islington*	£95
T. Neal	100		

* Accepted.

LONDON.—For providing and fixing heating apparatus on the low pressure hot-water system, with the necessary boiler, for the enlargement of the Canonbury-road School, Islington, now in course of erection for the School Board for London. Mr. T. J. Bailey, Architect:—

J. C. & J. S. Ellis	£590	Purcell & Nobbs	£333
G. Davis	400	Maguire & Sons, Dawson-street, Dublin*	316
W. G. Cannon	390		
R. H. & J. Pearson	390		

* Recommended by the Works Committee for acceptance.

LONDON.—Accepted for alterations at the "Globe" Restaurant, Moorgate-street. Mr. J. W. Brooker, architect, Railway Approach, London Bridge:—
Estimate No. 1.—Edwards & Medway £130 0 0
Estimate No. 2.—Edwards & Medway 165 9 9

MALAHIDE (Ireland).—For the erection of a dispensary for the Balrothery Union Guardians. Mr. C. M. Tuite, C.E., architect, Dalymount Cottage, Drogheda:—
Patrick Tolan, Balbriggen £510 0 0
[This was the only tender received. The work will be again advertised.]

MARKET HARBOROUGH.—For the construction of new streets' sewerage works, &c., St. Mary's Building Estate, for Mr. H. H. Holloway. Mr. Herbert G. Coales, engineer, Market Harborough. Quantities by engineer:—

H. Hewitt	£3,200	J. T. Wingrove	£2,570
John Holm	3,026	J. Smith	2,394
Currell & Lewis	2,748	Jewell	2,317
H. Lee	2,641	F. Barlow, Rothwell*	2,258

* Accepted.

NUNEATON.—Accepted for building lodge and chapel, supplying and fixing iron fencing, and levelling and draining new cemetery, for the Attleborough Burial Board. Mr. John Moreton, architect, Nuneaton:—
Thomas Gudgeon, Attleborough, Nuneaton* £450 0 0
* Lodge and Chapel.
Fencing.
W. Hayward & Son, Wolverhampton ..... 8s 5d. per yard.

PINNER (Middlesex).—For the erection of a cottage-studio, for Mr. Louis Davis. Messrs. Harvey & Hewitt, architects, 7, Great College-street, Westminster. Quantities by Mr. E. C. Pinks, 45, Parliament-street, Westminster:—

H. S. Lee	£693	T. Turner	£616
J. F. Sargeant	687	F. Lanter, Harrow*	570
Pennant & Co.	686		

* Accepted.

SOUTH SHIELDS.—For alterations and additions to the premises of Messrs. Barbour & Telford, Market-place and Dean-street, South Shields. Mr. Henry Grieves, architect, Albany-chambers, South Shields:—

W. Scott	£998 10	W. J. Robertson	£898 14
R. Summerbell	940 0	P. S. Winter, South Shields (accepted)	885 0
R. Goodwin & Son	920 0		

STONEHAVEN (N.B.).—Accepted for the erection of an auction-mart, for the Stonehaven Auction Company, Limited. Mr. George Gregory, architect, Stonehaven, N.B.:—
Carpenter Work—R. Thomson & Sons, Stonehaven £293 0 0
Slater Work—J. Lindsay & Son, Montrose 104 12 4
Concrete Work—Scott & Cellar, Aberdeen 87 0 0
Plumber Work—T. Davidson, jun., Banchory 47 10 0

TONBRIDGE.—For the erection of four residences in Park-road, for Mr. R. W. Annison. Mr. J. W. Brooker, architect, London Bridge, S.E.:—

Jarvis	£3,435	Battley, Sons, & Holness	£5,767
G. & F. Penn	6,415	Edwards & Medway	5,739
Burman & Son	5,849	R. Langridge*	5,658

* Accepted.

TOTTENHAM.—For the erection of Woodland Park Schools, for the Tottenham School Board. Mr. C. Bell, architect, 3, Salters' Hall-court, Cannon-street, London. Quantities by Messrs. D. Campbell & Son, 69, Finsbury-pavement, E.C.:—

Buckingham & Son	£18,789 9	Chessum & Sons	£16,495 0
Reed, Blight, & Co.	18,516 0	McCormick & Sons	15,989 0
Flew & Co.	16.900 0	Allen & Sons	15,965 0
A. Kellett	16,700 0	Percival Hart	15,354 10
W. Brass & Son	16,555 0	Charles Way*	15,320 0
Perry & Co.	16,547 0	F. J. Coxhead†	14,753 0

* Accepted. † Withdrawn.

WAKEFIELD.—Accepted for the erection of thirteen dwelling-houses at Grime-lane, Sharlston, near Wakefield. Mr. Herbert Long, architect and surveyor, Brunswick-street, Wakefield:—
R. L. Teal, Normanton £2,035 0 0

WANSTEAD.—For internal repairs and decorations to Great Blake Hall and to the stabling and cottage adjoining, and the two entrance-lodges, Wanstead, Essex. Mr. Herbert Riches, architect and surveyor, 3, Crooked lane, King William-street, E.C.:—

T. Osborn & Sons	£747 0	W. Mundy*	£675 0
F. J. Evans	737 16		

* Accepted.

WATERINGBURY (Kent).—For the erection of Pizen Wells Mission Room. Messrs. J. E. K. & J. P. Cutts, architects.

Dray & Son	£504 4	Wallis & Son	£500 0
J. Clements	503 0	W. Wells	494 0

WATFORD.—For the erection of a house in the Malden-road, for Mr. J. Neighbour. Messrs. J. E. K. & J. P. Cutts, architects:—

Dove & Co.	£672 0	Clifford & Gough	£574 10
J. Darvill	582 0		

WOODBRIDGE (Suffolk).—For new head-master's house, Woodbridge Grammar School. Mr. Fred Chancellor, architect, Chelmsford, Essex. Quantities by Messrs. Curtis & Sons, 119, London Wall:—

Cornish & Gaymer	£11,964 0 0	Everett & Son	£10,744 0 0
Adams	11,772 0 0	Brown	10,675 0 0
Letch	11,500 12 6	Bennett	10,649 19 11
Reed & Son	11,500 0 0	Younge & Son	10,557 0 0
Barrell	11,475 0 2	Pells & Son	10 537 0 0
Ripper & Son	11,20) 0 0	Hawes	10,500 0 0
West	10,950 0 0	Girling & Coe	10 393 0 0
Bray	10,862 0 0	Smith	9,937 0 0

Works at Claybury Asylum.—Mr. James Bloomfield writes to say that his tender for the formation of roads and other works at Claybury Asylum, near Woodford, for the London County Council, was wrongly printed last week as 3,455*l.* 10s. 5d. It should have been 13,455*l.* 10s. 5d. We may add that, by resolution of the Council on Tuesday last, Messrs. John Mowlem & Co.'s tender was accepted.

TO CORRESPONDENTS.

R. (it is no matter how the word is derived; its accepted meaning among engineers is in the sense used in the passage you refer to, and it cannot be altered now).—W. S.. Heidelberg (we have already said sufficient on the subject). E. M. S. (thanks, but too small for insertion.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

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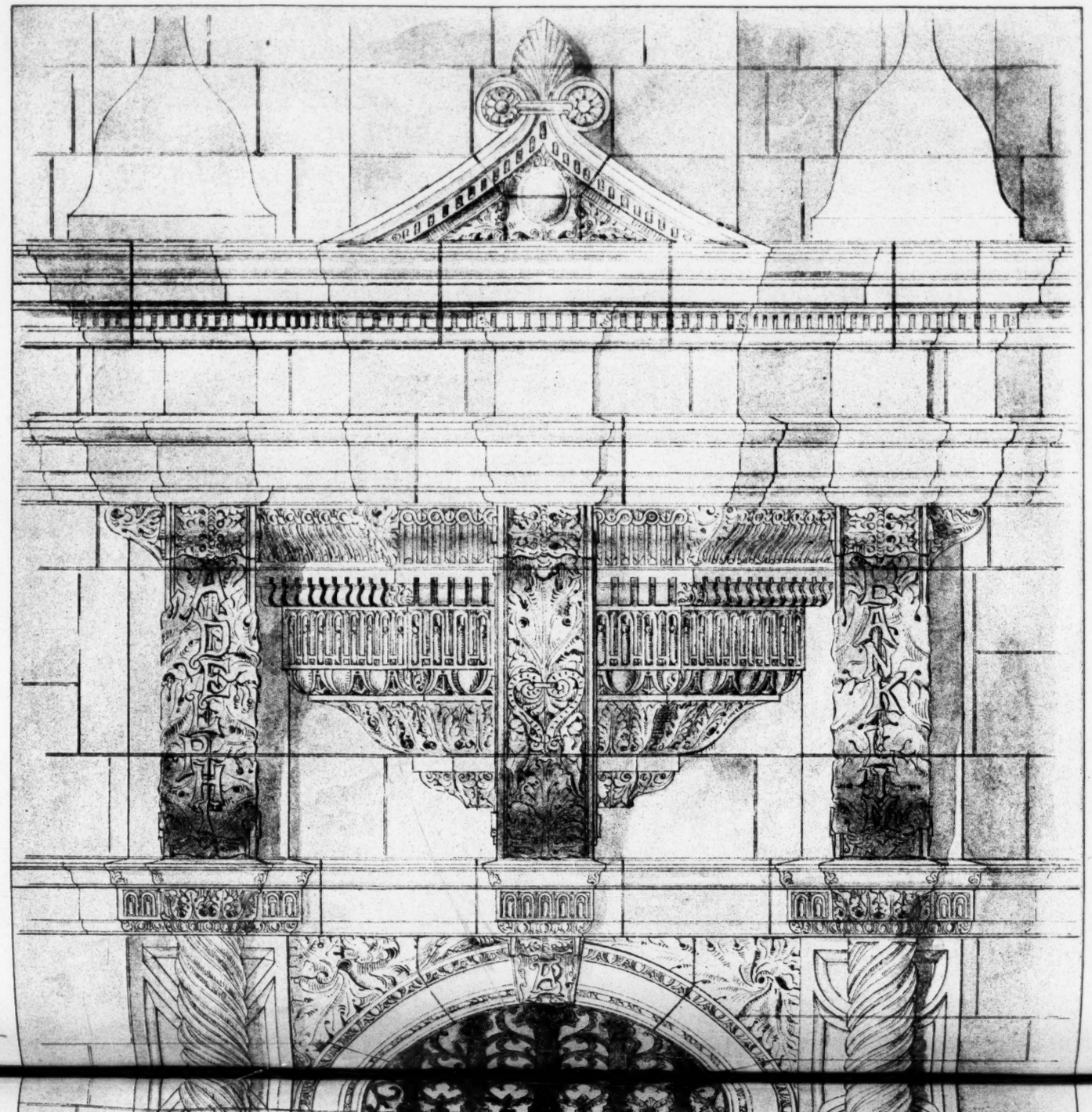

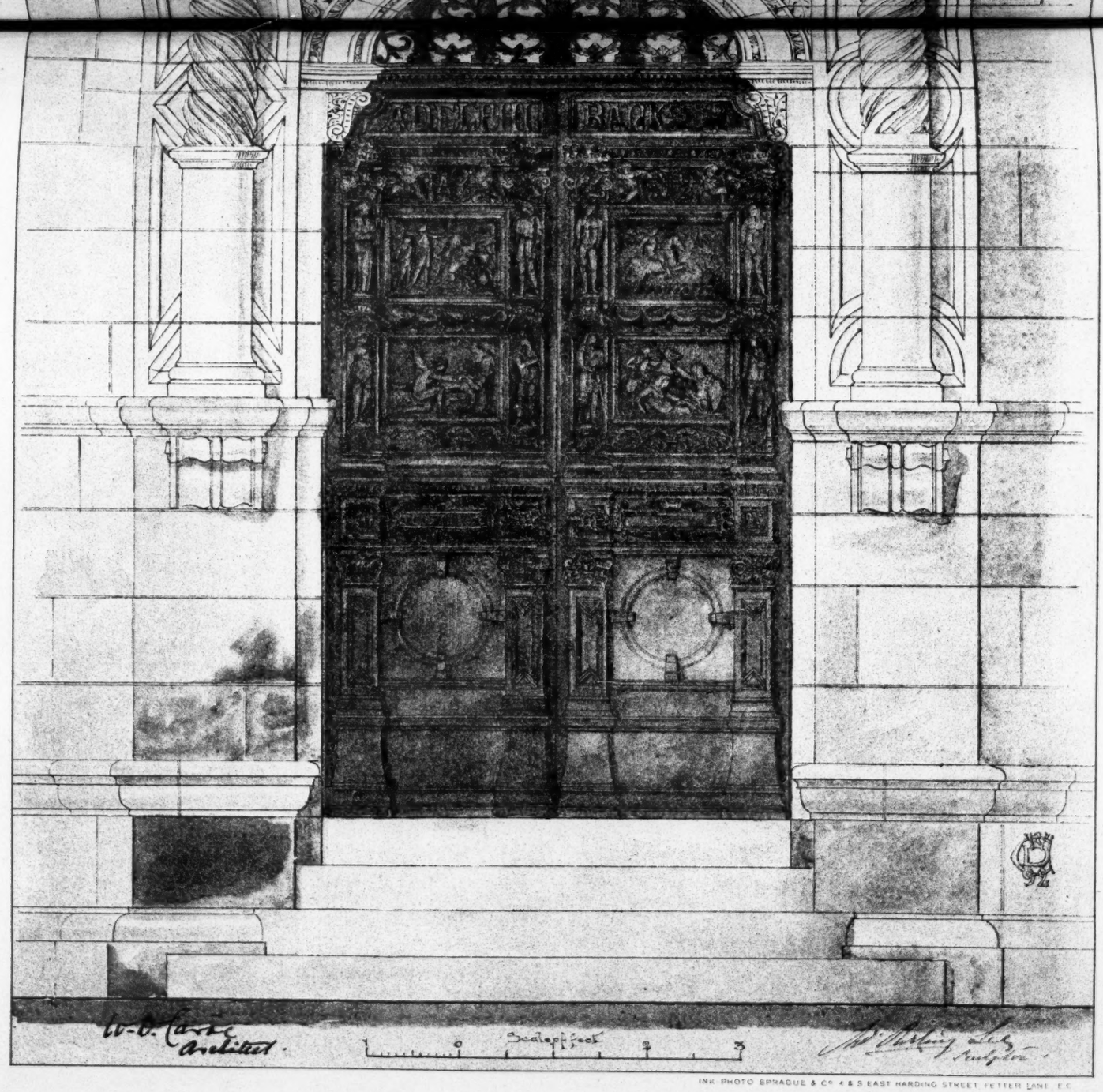

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BRONZE DOORS, ADELPHI BANK, LIVERPOOL.—Mr. W. D. Caröe, F.R.I.B.A., Architect.

Royal Academy Exhibition, 1892.

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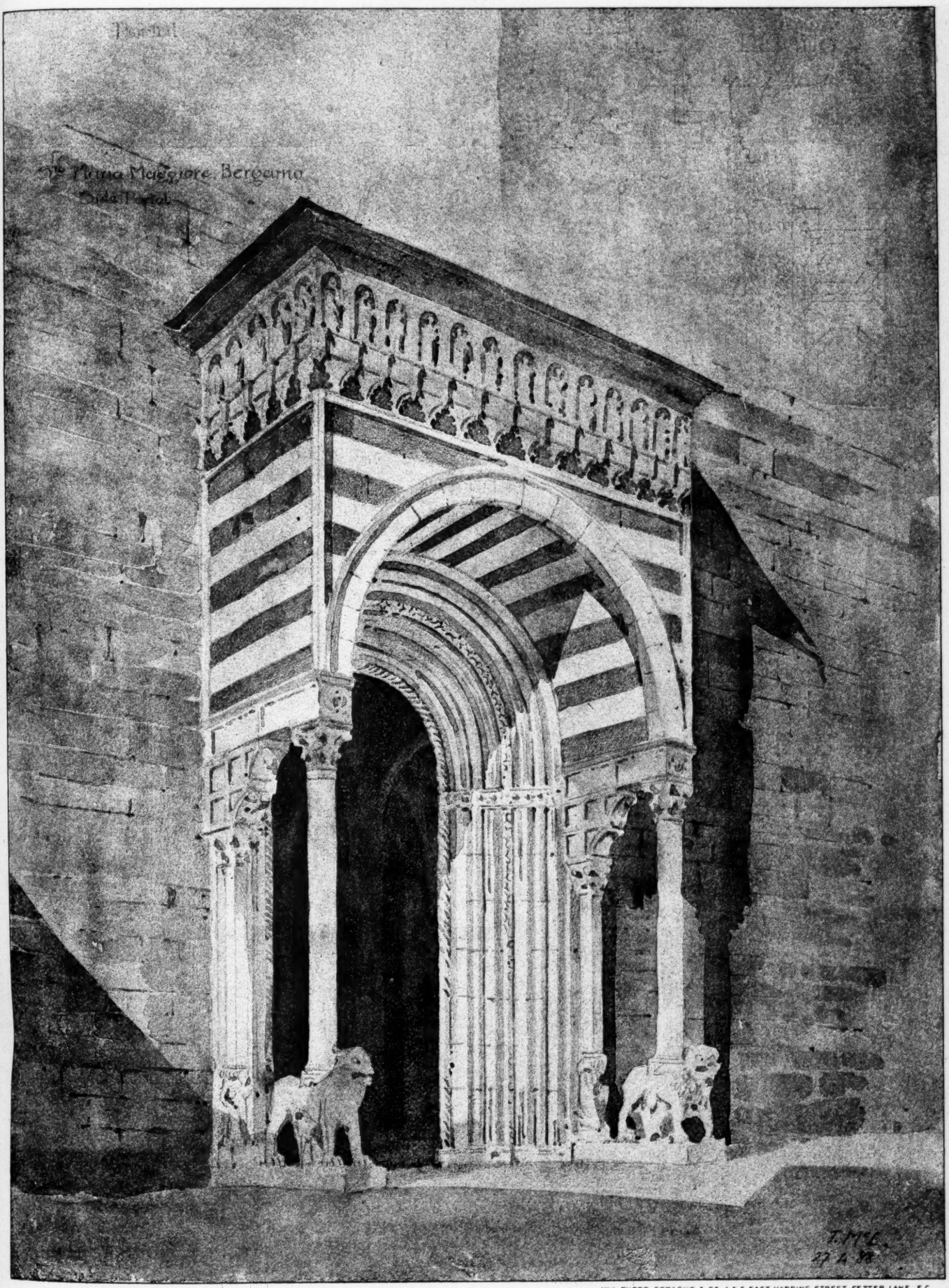
Royal Academy Exhibition, 1892.



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Royal Academy Exhibition, 1892.

Royal Academy Exhibition, 1892.

Royal Academy Exhibition, 1892.

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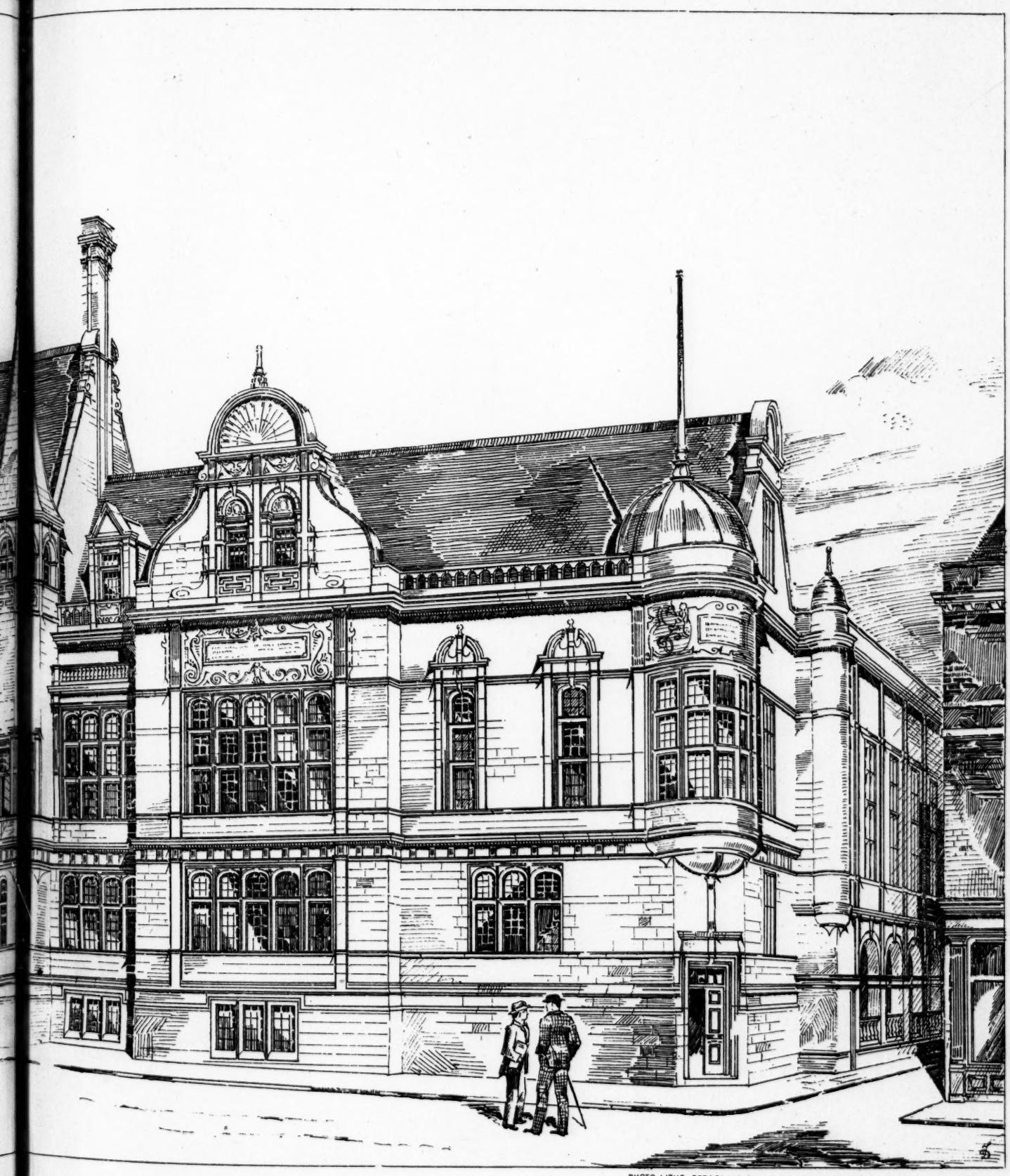

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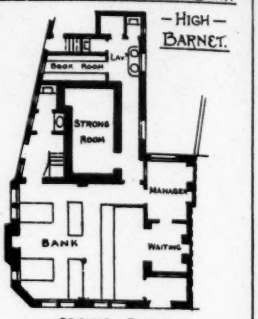

GROUND PLAN

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